

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER NO. R5-2003-0018

WASTE DISCHARGE REQUIREMENTS
FOR
NORCAL WASTE SYSTEMS OSTROM ROAD LANDFILL, INC.
FOR
OSTROM ROAD CLASS II SOLID WASTE LANDFILL FACILITY
YUBA COUNTY

The California Regional Water Quality Control Board, Central Valley Region, (hereafter Regional Board) finds that:

1. Norcal Waste Systems Ostrom Road Landfill, Inc. (hereafter Discharger) owns and operates the Ostrom Road Class II Solid Waste Landfill Facility. Norcal Waste Systems Ostrom Road Landfill, Inc. is a wholly owned subsidiary of Norcal Waste Systems, Inc. The site is located in unincorporated Yuba County and is immediately south of Ostrom Road and approximately 6 miles east of State Highway 65 and 1 mile east of Jasper Lane. Nearby population centers include the City of Marysville approximately 14 miles northwest of the site, and the City of Wheatland about five miles southwest of the site. The site occupies portions of Sections 10, 11, 14 and 15 of Township 14 North, Range 5 East, Mount Diablo Base Meridian, as shown in Attachment A, which is incorporated herein and made part of this Order.
2. The 261-acre facility is comprised of Assessor's Parcel Numbers (APN) 15-080-17. The facility has been in operation since 1995, and to date, approximately 34 acres out of a total landfill development of 225 acres has been constructed and approved for operation. The facility is currently permitted to develop and operate two separate waste disposal modules (Modules 1 and 2) with a total footprint of 221 acres. The disposal modules are separated by a former 40-foot wide 4-acre access easement. The Discharger proposes to incorporate the respective property within the Module 2 waste disposal footprint to form a single contiguous disposal footprint of 225 acres as shown in Attachment B, which is incorporated herein and made part of this Order. The Discharger also proposes to increase the fill height and final cover elevations (finish-grade contours) from elevation 180 above mean sea level (msl) to 365 feet msl. The two modules will ultimately consist of 18 cells (Cells 1A through 9A and 1B through 9B).
3. On 9 August 1996, the Regional Board issued Order No. 96-218, in which the facility was classified as a Class II waste disposal site for the discharge of municipal solid waste and designated wastes in accordance with the regulations in effect when the order was issued. This Order classifies the facility as a Class II landfill that accepts municipal solid waste and designated wastes in accordance with Title 27, California Code of Regulations, §20005, et seq. (Title 27).

SITE DESCRIPTION

4. The measured hydraulic conductivity of the upper 5 to 15 feet of native soils ranges between 1×10^{-5} and 2×10^{-6} cm/sec. Slug tests performed on the water bearing zones resulted in measured permeability values of 1×10^{-3} to 1×10^{-6} cm/sec with a geometric mean of 7×10^{-4} cm/sec.
5. The closest known faults are part of the Foothills fault zone located five miles east of the facility which has a moment magnitude of 6.5. The facility is located on a thick sequence of soil. In addition, the motion along the Foothills fault zone is normal-slip and not strike-slip. Therefore, the calculated peak ground acceleration (PGA) is increased by 20 percent to account for the normal-slip motion. This results in a design PGA of 0.36g based on a maximum credible earthquake.
6. Current land uses within 1,000 feet of the facility consist of active cattle grazing. Designated land uses surrounding the facility include Public to the north (Beale Air Force Base) and Potential Landfill and Landfill Buffer Area, and Valley Agriculture to the west, south and east. The nearest residence is located more than 2,000 feet west of the facility.
7. The facility receives an average of 25 inches of precipitation per year as measured at the Beale Air Force Base. The majority of the rainfall occurs between November and April. During the period between 1950 and 1997, a maximum annual precipitation of 46.3 inches was recorded in Marysville in 1983. Pan evaporation data from Marysville (1949 to 1953) averaged 55.6 inches annually with an average minimum of 0.96 inches in December and an average maximum of 10.2 inches in July.
8. The 1000-year, 24-hour precipitation event is 5.8 inches, based on Department of Water Resources' Rainfall Depth-Duration Frequency data for Beale Air Force Base (DWR #A00058400).
9. The waste management facility is generally located adjacent to the 100-year flood plain based on the Federal Emergency Management Agency's (FEMA) Flood Insurance Rate Map, Yuba County, Panel 400, May 17, 1982. Following the heavy storms in January 1997, high water marks adjacent to the landfill were staked. These elevations were approximately two feet higher than those indicated on the old FEMA map. Due to relatively limited hydrologic information for the general area, the recurrence time associated with the January 1997 storm is not known. As a result, the Discharger commenced a flood hazard study for the site. The results of the study concluded that the Discharger should maintain a minimum two-foot freeboard above the January 1997 high water elevations to ensure adequate flood protection from extreme flood events. To meet the recommended design elevation, two small segments of the southern perimeter road shall be raised by approximately one to three feet, and interim flood control measures shall be implemented. The proposed minor perimeter improvements will have no significant impact on restricting the base flood flow or reducing the temporary water storage.

10. There are 31 municipal, domestic, industrial, or agricultural groundwater supply wells within one mile of the site. Three water supply wells (15NO5E-10Q1, 15NO5E-10Q2 and 15NO5E-15B1) are located adjacent to the western boundary of the landfill facility. Norcal Waste Systems, Inc. owns all three wells. Groundwater is periodically pumped from Well 15NO5E-10Q1 and is used as dust control on the facility's dirt roads. The other two wells are not currently used.

WASTE CLASSIFICATION

11. The Discharger proposes to continue to discharge non-hazardous solid waste, inert wastes, designated wastes and wastewater treatment sludge which are defined in §20164 of Title 27. Non-hazardous solid waste that contains total lead in excess of 350 parts per million may be disposed of in the Class II landfill in accordance with the permitting requirements of Section 25157.8 of the Health and Safety Code. Building and construction debris may have adhered paint. Nonhazardous solid wastes includes municipal solid wastes, as referred to in the Code of Federal Regulations, Title 40, Part 258.2.

SURFACE AND GROUND WATER CONDITIONS

12. The *Water Quality Control Plan for the Sacramento River Basin and San Joaquin River Basin, Fourth Edition* (hereafter Basin Plan), designates beneficial uses, establishes water quality objectives, and contains implementation plans and policies for all waters of the Basin.
13. Surface water drainage from the site is primarily to the south towards Best Slough, which borders the southern end of the landfill property. A small portion of the northwestern part of the site drains to Hutchinson Creek, which flow northward through Beale Air Force Base. Both of these streams eventually flow into the Sacramento River.
14. The designated beneficial uses of Sacramento River, as specified in the Basin Plan, are municipal and domestic supply, agricultural irrigation supply, stock watering, hydroelectric power generation, recreation, freshwater habitat, fish migration and spawning, wildlife habitat, ground water recharge, fresh water replenishment, preservation of rare and endangered species, and esthetic enjoyment.
15. The first encountered groundwater in the continuous water bearing zone is currently approximately 26 to 55 feet below the native ground surface. Groundwater elevations currently range from approximately 62 feet MSL to 95 feet MSL. Groundwater is generally unconfined, although some localized confinement can occur. Historical groundwater data from 1913 indicates that prior to agricultural development, groundwater was encountered approximately 20 to 30 feet below ground surface. Following the extensive development of irrigation in the late 1940's, overdraft of groundwater supplies caused groundwater levels in the area to decline greatly. In 1983, surface water was introduced as a source for irrigation and groundwater levels have subsequently increased. At the current rebound rate, groundwater levels may reach pre-development levels within less than 15 years. The

historical water levels in 1948 are an appropriate estimate of the highest anticipated groundwater for the landfill.

16. Based on grain-size distribution tests completed on soils at the site, the estimated capillary rise is 2.5 feet for sandy clay soils and 0.1 to 2.5 feet for sandy and gravelly soils with varying amounts of silts and clays. The estimated average capillary rise across the site at any point in time is approximately 2.5 feet.
17. Shallow perched groundwater near the landfill appears to be of limited lateral extent. A zone of perched water is located in the vicinity of Piezometer PZ-11 which was installed near the northern side of the landfill in October 2001. The piezometer is screened from 10 to 20 feet bgs in a sand and gravel layer and 0.2 to 5.0 feet of water has been detected in the piezometer since its installation in October 2001. Piezometers PZ-12 and PZ-13 which were also installed near the northern side of the landfill have generally been dry since their installation in October 2001 and June 2002, respectively.
18. Monitoring data indicates background groundwater quality in the continuous water bearing zone has an electrical conductivity (EC) ranging between 160 and 490 micromhos/cm, with total dissolved solids (TDS) ranging between 140 and 270 mg/l.
19. The direction of groundwater flow is from east to west with a groundwater gradient of approximately 0.013. Current groundwater gradients decrease to 0.0025 in the west due to a groundwater production well located at the west side of the site.
20. The designated beneficial uses of the groundwater, as specified in the Basin Plan, are domestic and municipal, agricultural supply, industrial process supply, and industrial process supply.

GROUNDWATER MONITORING

21. The facility's current groundwater monitoring network consists of eight (8) groundwater monitoring wells (Attachment B). Three wells (MW-1, MW-2 and MW-3) monitor up-gradient, background water quality. The other five monitoring wells (MW-4 through MW-8) are detection monitoring wells. Piezometers PZ-11, PZ-12 and PZ-13 which monitor shallow, perched groundwater are assigned to the corrective action monitoring program as specified in Monitoring and Reporting Program No. R5-2003-0018.
22. Volatile organic compounds (VOCs) are often detected in a release from a landfill, and are the primary waste constituents detected in groundwater beneath a municipal solid waste landfill (see Finding No. 26). Since volatile organic compounds are not naturally occurring and thus have no background value, they are not amenable to the statistical analysis procedures contained in Title 27 for the determination of a release of wastes from a Unit.

23. Sections 20415(e)(8) and (9) of Title 27 provide for the non-statistical evaluation of monitoring data that will provide the best assurance of the earliest possible detection of a release from a Unit in accordance with §20415(b)(1)(B)2.-4. of Title 27. However, Title 27 does not specify a specific method for non-statistical evaluation of monitoring data.
24. The Regional Board may specify a non-statistical data analysis method pursuant to Section 20080(a)(1) of Title 27. Section 13360(a)(1) of the California Water Code allows the Regional Board to specify requirements to protect underground or surface waters from leakage from a solid waste site, which includes a method to provide the best assurance of determining the earliest possible detection of a release.
25. In order to provide the best assurance of the earliest possible detection of a release of **non-naturally** occurring waste constituents from a Unit, this Order specifies a non-statistical method for the evaluation of monitoring data.
26. The specified non-statistical method for evaluation of monitoring data provides two criteria (or triggers) for making the determination that there has been a release of **non-naturally** occurring waste constituents from a Unit. The presence of two non-naturally occurring waste constituents above their respective method detection limit (MDL), or one non-naturally occurring waste constituent detected above its practical quantitation limit (PQL), indicates that a release of waste from a Unit has occurred. Following an indication of a release, verification testing will be conducted to determine whether there has been a release from the Unit, or there is a source of the detected constituents other than the landfill, or the detection was a false detection. Although the detection of one non-naturally occurring waste constituent above its MDL is sufficient to provide for the earliest possible detection of a release, the detection of two non-naturally occurring waste constituents above the MDL as a trigger is appropriate due to the higher risk of false-positive analytical results and the corresponding increase in sampling and analytical expenses from the use of one non-naturally occurring waste constituent above its MDL as a trigger.

WATER QUALITY DEGRADATION AND CORRECTIVE ACTION PROGRAM

27. VOCs and elevated concentrations of total dissolved solids (TDS), chloride and metals have been detected in Pan Lysimeter PL-1A which is directly overlain by leachate Sump 1A of Landfill Cell 1A. In September 2000, the Discharger began implementation of an Evaluation Monitoring Program (EMP) to assess the nature and extent of the release from the sump. The results of the EMP and associated integrity testing of the composite liner (geomembrane and geosynthetic liner) located between the Pan Lysimeter PL-1A and Sump 1A are presented in the Discharger's January 2001 Engineering Feasibility Study (EFS). The results of the integrity test show that there is a leak between the sump and the pan lysimeter. The leak may be due in part to a defect in a retrofitted booted sleeve that envelopes the Pan Lysimeter PL-1A riser access pipe and/or defect(s) in the composite liner. Due to reconstruction of the sump at a higher elevation in 1998, Pan Lysimeter PL-1A is underlain by fill and the original 2-foot thick low-permeability clay liner underneath which is located Suction Lysimeter VZ-2.

Data collected from Suction Lysimeter VZ-2 show a statistically significant upward trend for chloride. Chloride was detected at a maximum concentration of 45 mg/L which exceeds the concentration limit of 4.7 mg/l. In addition, the VOC chloromethane has been detected at trace concentrations in two consecutive quarterly monitoring events (Second and Third Quarter 2002). In June 2002 Piezometer PZ-13 was installed adjacent to the riser pipe for Pan Lysimeter PL-1A to monitor for potential leachate leakage from Sump 1A into the unsaturated zone and shallow ephemerally perched groundwater.

28. A release of VOCs has occurred from Cell 2. In April 2001, liquid containing VOCs at concentrations up to 20 µg/L was detected in Pan Lysimeter PL-2A which is located beneath Sump 2A for Cell 2. In August 2001, the Discharger began implementation of an EMP to evaluate the possible sources of liquids and VOCs detected in Pan Lysimeter PL-2A. To evaluate the potential source of liquids in PL-2A, two piezometers (PZ-11 and PZ-12) were installed along the north side of Cell 2 and liquid levels in PL 2A and Sump 2A were evaluated. Both piezometers were screened in a sand and gravel layer from approximately 10 to 20 feet below ground surface (bgs). To evaluate the potential source of VOCs in PL 2A, two soil probes were advanced approximately 25 to 30 feet north of Cell 2 and soil gas samples were obtained from depths of approximately 10 feet bgs. The preliminary results of the EMP and a description of the specific hydrogeologic conditions and proposed corrective action measures are described in the Discharger's November 2001 proposed EFS. Data collected as a part of the EMP and from investigations conducted for the EFS show the presence of VOCs in soil gas in shallow soils approximately 25 to 30 feet north of landfill Cell 2. In addition, VOCs have been consistently detected in liquids from Pan Lysimeter PL 2A and in Piezometer PZ-11. In November 2001, Regional Board Staff requested a revised EFS which incorporates the necessary gas control measures and describes the proposed installation of dedicated sump pumps with automated fluid level switches in Sumps 1A and 2A and transducers in pan lysimeters PL-1A and PL-2A. The Discharger submitted a workplan for interim landfill gas control measures to control the source of landfill gas (LFG) impacting the vadose zone. An amended version to the workplan was approved on 5 June 2002. The interim measures were designed to reduce LFG pressure and gas-phase concentrations of VOCs in the leachate collection and removal layer at the bottom of the landfill cells by connecting a LFG extraction system to the sump risers and cleanout pipes in Cells 1 and 2.
29. Corrective action measures for the releases from Landfill Cells 1A and 2A consist of implementation of the landfill gas control measures described in Finding 28 and an automated leachate extraction system in Sumps 1A and 2A. Operation of the landfill gas control system commenced on 30 October 2002. Automated pumping systems have been installed in both leachate sumps to continuously maintain less than one vertical foot of leachate over the base of the sumps. Pressure transducers have been installed in underlying Pan Lysimeters PL 1A and PL 2A allowing for automated measurements of liquid levels above the base of the pan lysimeters. Six monthly reports containing updated information on gas system performance and monitoring data are due on the dates specified in Provision I.13.D. A Corrective Action

Assessment Report which presents an assessment of the 6 months of interim corrective action measures is due on 15 May 2003. If the LFG gas concentrations (in particular VOC concentrations) do not exhibit significant downward trends during the interim period then additional corrective action measures shall be included in the Corrective Action Assessment Report.

30. The Monitoring and Reporting Program describes the corrective action monitoring that is required to demonstrate the effectiveness of the corrective action measures per Title 27, Section 20430, as well as concurrent detection monitoring to provide the best assurance of the detection of potential subsequent releases per Title 27, Section 20385(a)(4)(c) and Section 20420. The Discharger must demonstrate that the facility is in compliance with its Water Quality Protection Standard, including any applicable concentration limits greater than background, before the facility can cease corrective action monitoring and return to facility-wide detection monitoring.

LINER PERFORMANCE DEMONSTRATION

31. On 15 September 2000 the Regional Board adopted Resolution No. 5-00-213 Request For The State Water Resources Control Board To Review The Adequacy Of The Prescriptive Design Requirements For Landfill Waste Containment Systems To Meet The Performance Standards Of Title 27. The State Board responded, in part, that "a single composite liner system continues to be an adequate minimum standard" however, the Regional Board "should require a more stringent design in a case where it determines that the minimum design will not provide adequate protection to a given body of groundwater."
32. In a letter dated 17 April 2001, the Executive Officer notified Owners and Operators of Solid Waste Landfills that "the Regional Board will require a demonstration that any proposed landfill liner system to be constructed after 1 January 2002 will comply with Title 27 performance standards. A thorough evaluation of site-specific factors and cost/benefit analysis of single, double and triple composite liners will likely be necessary."
33. On 26 August 2002, the Discharger submitted a liner performance demonstration report and a design report for the proposed Cell 2, Phase 3 (Cell 2B) Class II liner system. The demonstration report was submitted to demonstrate that the proposed liner system would comply with the Title 27 performance standard. The proposed liner system consisted of a 6.3-acre double composite base liner and a 0.6-acre single composite side-slope liner with slopes at an inclination of 3H:1V. The report demonstrated that the proposed liner system was designed and would be constructed to prevent the migration of wastes from the Cell 2, Phase 3 (Cell 2B) module and was approved by the Executive Officer on 9 September 2002. Cell 2B is currently under construction.
34. On 1 October 2002, the Discharger submitted a liner performance demonstration report for all future cells. A double liner system is proposed for future landfill cells at the landfill unless a

site-specific demonstration is conducted which demonstrates that the prescriptive standard or another design complies with the Title 27 performance standard.

CONSTRUCTION AND ENGINEERED ALTERNATIVE

35. On 17 June 1993, the State Water Resources Control Board adopted Resolution No. 93-62 implementing a State Policy for the construction, monitoring, and operation of municipal solid waste landfills that is consistent with the federal municipal solid waste regulations promulgated under Title 40, Code of Federal Regulations, Part 258 (Subtitle D).
36. Resolution No. 93-62 requires the construction of a specified composite liner system at new municipal solid waste landfills, or expansion areas of existing municipal solid waste landfills, that receive wastes after 9 October 1993.
37. Resolution No. 93-62 also allows the Regional Board to consider the approval of engineered alternatives to the prescriptive standard. Section III.A.b. of Resolution No. 93-62 requires that the engineered alternative liner systems be of a composite design similar to the prescriptive standard.
38. Section 20080(b) of Title 27 allows the Regional Board to consider the approval of an engineered alternative to the prescriptive standard. In order to approve an engineered alternative in accordance with §20080(c)(1) and (2), the Discharger must demonstrate that the prescriptive design is unreasonably and unnecessarily burdensome and will cost substantially more than an alternative which will meet the criteria contained in §20080(b), or would be impractical and would not promote attainment of applicable performance standards. The Discharger must also demonstrate that the proposed engineered alternative liner system is consistent with the performance goal addressed by the particular prescriptive standard, and provides protection against water quality impairment equivalent to the prescriptive standard in accordance with §20080(b)(2) of Title 27.
39. Section 13360(a)(1) of the California Water Code allows the Regional Board to specify the design, type of construction, and/or particular manner in which compliance must be met in waste discharge requirements or orders for the discharge of waste at solid waste disposal facilities.
40. The Discharger proposes a liner system which will be designed and constructed to prevent migration of wastes from the Unit to adjacent natural geologic materials, groundwater, or surface water during disposal operations, closure, and the postclosure maintenance period in accordance with the criteria set forth in Title 27 for a Class II landfill, and the provisions in State Water Resources Control Board Resolution No. 93-62 for municipal solid wastes.
41. Approximately 34 acres out of the total 225-acre landfill footprint have been constructed to date. The existing containment system consists of a prescriptive single composite liner system consisting of the following from top to bottom: 12-inches of operations soil; a

geotextile filter; 12-inches of LCRS (permeability greater than or equal to 1 cm/s); 60-mil HDPE geomembrane and; 24-inches of low-permeability soil liner (permeability less than or equal to 1×10^{-7} cm/s). On the side-slopes, the containment system consists of the following components from top to bottom: 24-inches of operations soil; LCRS geocomposite drainage layer; 60-mil HDPE geomembrane and; 24-inches of low-permeability soil liner (permeability less than or equal to 1×10^{-7} cm/s).

42. All containment structures shall be designed and constructed under the direct supervision of a California registered civil engineer or certified engineering geologist and shall be certified by that individual as meeting the prescriptive standards and performance goals of Title 27 prior to waste discharge.
43. Construction will proceed only after all applicable construction quality assurance plans have been approved by Executive Officer.
44. The Discharger submitted a Report of Waste Discharge requesting approval of an engineered alternative to the Title 27 prescriptive standard which specifies that a minimum of five (5) feet of separation shall be maintained between waste and the highest anticipated elevation of underlying groundwater including the capillary fringe.
45. The engineered alternative proposed by the Discharger to mitigate the groundwater separation requirement consists of a 60-mil HDPE geomembrane which will be installed beneath the **entire** base composite liner system to create a barrier to groundwater or capillary rise. Up to approximately 15% of the landfill (primarily in the vicinity of proposed Phase 4 of Cell 1) may have groundwater separation distances of 2.5 to 5 feet between wastes and the highest anticipated groundwater including capillary rise. The proposed base grade elevations are presented in Attachment C and the maximum anticipated groundwater elevations are presented in Attachment D. The geomembrane will be overlain by a leak detection geocomposite and a prescriptive composite liner system and will serve as an integral part of the liner system. The leak detection geocomposite will extend to the leak detection monitoring sump described in Findings 49 and 50.
46. The Discharger adequately demonstrated that the prescriptive standard requiring a minimum of five (5) feet of separation between the waste and the highest anticipated elevation of underlying groundwater would be unreasonable and unnecessarily burdensome. Meeting the prescriptive groundwater separation requirements would require the establishment of an interior sump located away from the landfill perimeter. These sumps are undesirable due to poor access and greater susceptibility of sump access to impacts by refuse settlement. The Discharger has demonstrated that the proposed engineered alternative is consistent with the performance goals of the prescriptive standard and affords equivalent protection against water quality impairment.
47. The site has maintained leachate extraction records since its initial operation in 1995. During 1996 and 1997, leachate extraction rates were similar, reaching a peak of 200 to 220 gallons

per acre per day (gpad) with an average annual rate of approximately 95 gpad. In February 1998, leachate extraction rates increased considerably reaching a peak average value of 350 gpad. The leachate collection and removal system (LCRS) is designed to accommodate a leachate generation rate of 350 gpad.

48. The LCRS in all future cells will consist of a 12-inch thick gravel blanket drain blanket sloping at 1 to 2 percent to a central perforated header pipe which will drain with a minimum slope of 0.5 percent to the LCRS sumps. The central head collection pipes will be placed within the 12-inch thick gravel blanket drain. The pipes for future modules will be 6-inch diameter, HDPE with a size-dimension ratio (SDR) of 11. The LCRS gravel or an equivalent drainage media, will provide a minimum hydraulic conductivity of 1 cm/sec. The LCRS gravel shall be overlain by a filter geotextile.
49. Each of the LCRS sumps in the future cells will be designed with a leak detection monitoring sump below the primary base liner system. The leak detection monitoring sump will be excavated into the subgrade below the LCRS sump at the lowest point of the module floor. Access to the leak detection sump will be via a slope riser pipe. The leak detection monitoring sump will be manually monitored on a semi-annual basis. Any liquids in the leak detection monitoring sump will be removed with a pump via the slope riser pipe. Gas samples will be obtained on a semi-annual basis.
50. The leak detection sump will consist of a 12-inch thick zone of gravel providing a minimum hydraulic conductivity of 1 cm/sec.
51. Interim landfill gas control measures commenced on 30 October 2002 in accordance with an approved workplan. Operation of the gas collection system is a required corrective action measure to reduce gas-phase concentrations of VOCs which have been released from the landfill into the unsaturated zone. Landfill gas is extracted from the LCRS through the sump risers in Cells 1 and 2 and then treated using activated charcoal vessels. To evaluate the effectiveness of the gas control system, gas samples are obtained on a monthly basis and monitored for methane, carbon dioxide and oxygen as described in Monitoring and Reporting Program No. R5-2003-0018. After 6 months of operation of the system (30 April 2003) the effectiveness of the interim gas control system will be assessed. Additional gas control measures will be required if the existing measures do not adequately reduce gas-phase VOC concentrations at the designated corrective action landfill gas monitoring points.
52. Additional gas extraction and control systems will be installed in future cells as the landfill expands. The long-term gas controls will consist of a network of vertical and/or horizontal collection wells that will transport the landfill gas for disposal through combustion at a flare or a landfill gas-to-energy facility. The Discharger is currently designing and initiating the permitting process for installing permanent gas control systems for the existing refuse disposal area and is in the planning stage for addressing gas controls for future disposal areas.

OPERATION OF THE FACILITY

53. The refuse fill is placed in lifts 10 to 15 feet thick. Refuse is spread and compacted in 2-foot-thick layers on a 5:1 to 3:1 (maximum) sloped working face, consistent with optimum slope angles for landfill compaction equipment operation. At the end of each working day, cover material is placed over the active working face. Daily cover materials consist of a 6-inch soil layer or other approved alternative cover. One foot of soil is placed on any area that will not receive wastes for 180 days. Surface grading is maintained at all times to insure lateral runoff and to prevent ponding over areas in which waste is buried.
54. Leachate is pumped from the landfill sumps to tank trucks for transport to the City of Marysville wastewater treatment plant for disposal or used onsite on lined areas for dust control during the dry season (between 15 April and 15 October).
55. The Discharger's current plans indicate that the landfill will reach capacity by the year 2066. Site life calculations are based on a refuse capacity of approximately 27,610,000 tons, which assumes a compacted refuse density of 1,395 pounds per cubic yard and accounts for settlement.

CEQA AND OTHER CONSIDERATIONS

56. The Yuba County Community Services Department certified the final environmental impact report for the facility on 23 June 1999. Yuba County Community Services Department filed a Notice of Determination on 22 March 2000 in accordance with the California Environmental Quality Act (Public Resources Code Section 21000 et seq.) and CEQA guidelines (14 CCR Section 15000 et seq.). The Regional Board considered the environmental impact report and incorporated mitigation measures from the environmental impact report into these waste discharge requirements designed to prevent potentially significant impacts to design facilities and to water quality.
57. This order implements:
 - a. The Water Quality Control Plan for the Sacramento River and San Joaquin River Basins, Fourth Edition};
 - b. The prescriptive standards and performance goals of Chapters 1 through 7, Subdivision 1, Division 2, Title 27, of the California Code of Regulations, effective 18 July 1997, and subsequent revisions;
 - c. The prescriptive standards and performance criteria of RCRA Subtitle D, Part 258; and
 - d. State Water Resources Control Board Resolution No. 93-62, *Policy for Regulation of Discharges of Municipal Solid Waste*, adopted 17 June 1993.

PROCEDURAL REQUIREMENTS

58. All local agencies with jurisdiction to regulate land use, solid waste disposal, air pollution, and to protect public health have approved the use of this site for the discharges of waste to land stated herein.
59. The Regional Board notified the Discharger and interested agencies and persons of its intent to prescribe waste discharge requirements for this discharge, and has provided them with an opportunity for a public hearing and an opportunity to submit their written views and recommendations.
60. The Regional Board, in a public meeting, heard and considered all comments pertaining to the discharge.
61. Any person affected by this action of the Regional Board may petition the State Water Resources Control Board to review the action in accordance with Sections 2050 through 2068, Title 23, California Code of Regulations. The petition must be received by the State Water Resources Control Board, Office of Chief Counsel, P.O. Box 100, Sacramento, California 95812, within 30 days of the date of issuance of this Order. Copies of the laws and regulations applicable to the filing of a petition are available on the Internet at http://www.swrcb.ca.gov/water_laws/index.html and will be provided on request.

IT IS HEREBY ORDERED, pursuant to Sections 13263 and 13267 of the California Water Code, that Order No. 96-218 is rescinded, and that the Norcal Waste Systems Ostrom Road Landfill, Inc., its agents, successors, and assigns, in order to meet the provisions of Division 7 of the California Water Code and the regulations adopted thereunder, shall comply with the following:

A. PROHIBITIONS

1. The discharge of 'hazardous waste' is prohibited. For the purposes of this Order, the term 'hazardous waste' is as defined in Title 23, California Code of Regulations, Section 2510 et seq.
2. The discharge of wastes outside of a Unit or portions of a Unit specifically designed for their containment is prohibited.
3. The discharge of waste to a closed Unit is prohibited.
4. The discharge to the landfill units of solid waste containing free liquid or moisture in excess of the waste's moisture holding capacity, is prohibited.
5. The discharge to landfill units of liquid or semi-solid waste (i.e., waste containing less than 50 percent solids), except dewatered sewage or water treatment sludge as provided in Section 20220(c) of Title 27, is prohibited.

6. The disposal of containerized liquids at this facility is prohibited.
7. The discharge of wastes which have the potential to cause corrosion or decay, or otherwise reduce or impair the integrity of containment structures or which, if commingled with other wastes in the unit, could produce violent reaction, heat or pressure, fire or explosion, toxic by-products, or reaction products which in turn:
 - a. require a higher level of containment than provided by the unit,
 - b. are restricted hazardous wastes, or
 - c. impair the integrity of containment structures,is prohibited.
8. The discharge shall not cause the release of pollutants, or waste constituents in a manner which could cause a condition of nuisance, degradation, contamination, or pollution of groundwater to occur, as indicated by the most appropriate statistical or nonstatistical data analysis method and retest method listed in this Order, the Monitoring and Reporting Program, or the Standard Provisions and Reporting Requirements.
9. The discharge of solid or liquid waste or leachate to surface waters, surface water drainage courses, or groundwater is prohibited.
10. The discharge shall not cause any increase in the concentration of waste constituents in soil-pore gas, soil-pore liquid, soil, or other geologic materials outside of the Unit if such waste constituents could migrate to waters of the State — in either the liquid or the gaseous phase — and cause a condition of nuisance, degradation, contamination, or pollution.

B. DISCHARGE SPECIFICATIONS

1. Wastes shall only be discharged into waste management units specifically designed for their containment and/or treatment, as described in this Order.
2. Prior to the discharge of waste to the landfill, all wells within 500 feet of the unit shall have sanitary seals which meet the requirements of the Yuba County Environmental Health Department or shall be properly abandoned. A record of the sealing and/or abandonment of such wells shall be sent to the Regional Board and to the State Department of Water Resources.
3. A minimum separation of 5 feet shall be maintained between wastes or leachate in existing Cells 1, 2A and 2B and the highest anticipated elevation of underlying groundwater including the capillary fringe. A continuous 60 -mil HDPE geomembrane shall be installed beneath the entire composite base liner system in all future cells to create a barrier to groundwater or capillary rise and to maintain a minimum separation of 2.5 vertical feet between wastes or leachate and underling groundwater.

4. The base grade elevations shall not be lower than those shown on Attachment C.
5. The discharge shall remain within the designated disposal area at all times.
6. Automated pumping systems shall be installed in all leachate sumps and operated to continuously maintain less than one vertical foot of leachate over the base of the sumps. If leachate levels exceed one foot or if liquid is detected in the underlying leak detection layer then the Discharger shall immediately cease the discharge of high-liquid content sludges and other high-moisture wastes to the landfill module and shall notify the Regional Board in writing within seven days. Notification shall include a time table for remedial or corrective action necessary to reduce leachate production.
7. The Discharger shall implement a waste acceptance program including a periodic load checking program to ensure that 'hazardous wastes' are not discharged to any Class II Landfill at the facility. The program shall also ensure that wastes exceeding moisture limitations are not discharged to Landfill units.

C. FACILITY SPECIFICATIONS

1. New landfill units and lateral expansions shall not be within jurisdictional waters of the United States (wetlands) unless the Discharger has successfully completed, and the Regional Board has approved, all demonstrations required for such discharge under 40 CFR 258.12(a).
2. The Discharger shall, in a timely manner, remove and relocate any wastes discharged at this facility in violation of this Order.
3. The Discharger shall immediately notify the Regional Board of any flooding, unpermitted discharge of waste off-site, equipment failure, slope failure, or other change in site conditions which could impair the integrity of waste or leachate containment facilities or precipitation and drainage control structures.
4. Intermediate cover shall be applied to areas of the landfill where filling is not anticipated within 180 days. Intermediate cover shall consist of one foot of compacted soil with a permeability less than 1×10^{-5} cm/sec or an approved engineered alternative. On landfill cells that are expanding in height over single composite liners (Cells 1A, 1B and 2A) the operator shall place an additional 12 inches of intermediate cover over areas where filling has not occurred, or the Discharger anticipates will not occur, for a period of two years. The active disposal area shall be confined to the smallest area practical based on the anticipated quantity of waste discharge and other waste management facility operations.
5. Water used for facility maintenance shall be limited to the minimum amount necessary for dust control, construction and to start the vegetative cover.

6. Landfill leachate shall be transported to an offsite wastewater treatment plant for disposal during the wet season.
7. The Discharger shall maintain in good working order any facility, control system, or monitoring device installed to achieve compliance with the waste discharge requirements.
8. Methane and other landfill gases shall be adequately vented, removed from the Unit, or otherwise controlled to prevent the danger of adverse health effects, nuisance conditions, or the impairment of the beneficial uses of surface water or groundwater due to migration through the unsaturated zone.
9. Surface drainage within the waste management facility shall either be contained on-site or be discharged in accordance with applicable storm water regulations.
10. Precipitation and drainage control systems shall be designed, constructed, and maintained to accommodate the anticipated volume of precipitation and peak flows from surface runoff under 1000-year, 24-hour precipitation conditions for Class II WMUs.
11. Annually, prior to the anticipated rainy season, any necessary erosion control measures shall be implemented, and any necessary construction, maintenance, or repairs of precipitation and drainage control facilities shall be completed to prevent erosion or flooding and to prevent surface drainage from contacting or percolating through wastes.
12. The Class II Landfill shall be designed to withstand the maximum credible earthquake without damage to the foundation, or to the structures which control leachate, surface drainage, erosion, or gas.
13. The Discharger shall maintain a *Storm Water Pollution Prevention Plan and Monitoring Program and Reporting Requirements* in accordance with State Water Resources Control Board Order No. 97-03-DWQ, or retain all storm water on-site.
14. Gas control measures shall be implemented for a Class II landfill module upon the confirmed presence of gas-phase concentrations of volatile organic compounds (VOCs) in the leak detection layer. The purpose of the confirmation sampling shall be to confirm the presence of VOCs as opposed to a particular VOC analyte. The gas control measures shall be sufficient to prevent the gas-phase migration of VOCs from the Class II modules.

D. GENERAL CONSTRUCTION SPECIFICATIONS

1. The Discharger shall submit for Executive Officer review and approval **prior to** construction, design plans and specifications for new Units and modules of existing Units, that include the following:
 - a. A Construction Quality Assurance Plan meeting the requirements of §20324 of Title 27; and

- b. A geotechnical evaluation of the area soils, evaluating their use as the base layer; and
 - c. An unsaturated zone monitoring system, which is demonstrated to remain effective throughout the active life, closure, and post-closure maintenance periods of the Unit, which shall be installed beneath the composite liner system in accordance with §20415(d) of Title 27.
- 2. The Discharger may propose changes to the liner system design prior to construction, provided that approved components are not eliminated, the engineering properties of the components are not substantially reduced, and the proposed liner system results in the protection of water quality equal to or greater than the design prescribed by Title 27 and this Order. The proposed changes may be made following approval by the Executive Officer. Substantive changes to the design require reevaluation as an engineered alternative and approval by the Regional Board.
 - 3. Construction shall proceed only after all applicable construction quality assurance plans have been approved by Executive Officer.
 - 4. Following the completion of construction of a Unit or portion of a Unit, and prior to discharge onto the newly constructed liner system, the final documentation required in §20324(d)(1)(C) of Title 27 shall be submitted to the Executive Officer for review and approval. The report shall be certified by a registered civil engineer or a certified engineering geologist. It shall contain sufficient information and test results to verify that construction was in accordance with the design plans and specifications, and with the prescriptive standards and performance goals of Title 27.
 - 5. A third party independent of both the Discharger and the construction contractor shall perform all of the construction quality assurance monitoring and testing during the construction of a liner system.
 - 6. If monitoring reveals substantial or progressive increases of leachate generation above the design leachate flow volume of 350 gpad (see Finding No. 47) by the Unit or portion of the Unit, such that the depth of fluid on any portion of the LCRS exceeds one vertical foot, the Discharger shall immediately notify the Regional Board in writing within seven days. The notification shall include a timetable for remedial or corrective action necessary to achieve compliance with the leachate depth limitation.

E. CLASS II LANDFILL CONSTRUCTION SPECIFICATIONS

- 1. The requirement for all future cells is a double liner system unless a site-specific demonstration is conducted and indicates that the prescriptive standard or another design complies with the Title 27 performance standards. The double liner system for base areas of the landfill will consist of the following components, from bottom to top: minimum 6-inch thick compacted subgrade comprised of low plasticity clays, high plasticity clays or

clayey sands; secondary 60-mil thick HDPE geomembrane; leak detection geocomposite leachate drainage layer with heat bonded non-woven geotextile on both sides; 2.5 feet of compacted clay with a permeability of 1×10^{-7} cm/s or less (the lower 6 inches is not subject to the permeability requirements); primary 60-mil thick HDPE geomembrane; 12-inch thick LCRS gravel layer; geotextile filter and; 12-inch thick operations layer.

2. The containment system for side slope areas of the landfill will consist of a single composite liner containing the following components, from bottom to top: prepared subgrade; 24 inches of compacted clay with a permeability of 1×10^{-7} cm/s or less; 60-mil textured HDPE geomembrane; LCRS geocomposite leachate drainage layer; and 24-inch thick operations layer. The secondary 60-mil thick HDPE geomembrane on the base liner shall extend up the base of the side-slope clay liner a minimum of two vertical feet.
3. An electrical leak location survey (LLS) shall be conducted after placement of the LCRS gravel to check the integrity of the primary (uppermost) geomembrane in a new cell. The results of the LLS and any repairs to the geomembrane shall be included in the relevant construction quality assurance report.
4. At closure, each landfill unit shall receive an engineered alternative final cover which is designed and constructed to function with minimum maintenance. The final cover for the top deck shall consist of the following from top to bottom: a one-foot thick vegetative soil layer; a 60-mil HDPE geomembrane layer; a low-permeability geosynthetic clay layer (GCL); and a one-foot thick foundation layer. The final cover for the side-slopes shall consist of the following from top to bottom: a one-foot thick vegetative soil layer; a geocomposite drainage layer; a 60-mil HDPE geomembrane layer; and a one foot-thick foundation layer. The permitted final cover elevations shown on Attachment E shall not be exceeded.
5. Closed landfill modules shall be graded to at least a three-percent (3%) grade and maintained to prevent ponding.

F. DETECTION MONITORING SPECIFICATIONS

1. The Discharger shall submit for Executive Officer review and approval a groundwater detection-monitoring program demonstrating compliance with Title 27 for any Unit expansion.
2. The Discharger shall comply with the detection monitoring program provisions of Title 27 for groundwater, surface water, and the unsaturated zone, and in accordance with Monitoring and Reporting Program No. R5-2003-0018. A detection-monitoring program for a new Unit shall be installed, operational, and one year of monitoring data collected prior to the discharge of wastes.

3. The Discharger shall provide Regional Board staff a minimum of **one week** notification prior to commencing any field activities related to the installation, repair, or abandonment of monitoring devices, and a minimum 48 hour notification prior to the collection of samples associated with a detection monitoring program, evaluation monitoring program, or corrective action program.
4. The Discharger shall comply with the Water Quality Protection Standard as specified in this Order, Monitoring and Reporting Program No. R5-2003-0018, and the **Standard Provisions and Reporting Requirements, dated April 2000**.
5. The Water Quality Protection Standard for organic compounds which are not naturally occurring and not detected in background groundwater samples shall be taken as the detection limit of the analytical method used (i.e., US-EPA methods 8260 and 8270), but not less than 0.1 parts per billion (ppb). The repeated detection of one or more non-naturally occurring organic compounds in samples above the Water Quality Protection Standard from detection monitoring wells is evidence of a release from the Unit.
6. The concentrations of the constituents of concern in waters passing the Point of Compliance shall not exceed the concentration limits established pursuant to Monitoring and Reporting Program No. R5-2003-0018.
7. For each monitoring event, the Discharger shall determine whether the landfill is in compliance with the Water Quality Protection Standard using procedures specified in Monitoring and Reporting Program No. R5-2003-0018 and §20415(e) of Title 27.
8. For any given monitored medium, the samples taken from all monitoring points and background monitoring points to satisfy the data analysis requirements for a given reporting period shall all be taken within a span not to exceed 30 days, unless the Executive Officer approves a longer time period, and shall be taken in a manner that ensures sample independence to the greatest extent feasible. Specific methods of collection and analysis must be identified. Sample collection, storage, and analysis shall be performed according to the most recent version of USEPA Methods, such as the latest editions, as applicable, of: (1) Methods for the Analysis of Organics in Water and Wastewater (USEPA 600 Series), (2) Test Methods for Evaluating Solid Waste (SW-846, latest edition), and (3) Methods for Chemical Analysis of Water and Wastes (USEPA 600/4-79-020), and in accordance with the approved Sample Collection and Analysis Plan.
9. If methods other than USEPA-approved methods or Standard Methods are used, the exact methodology shall be submitted for review and approval by the Executive Officer prior to use.
10. The **methods of analysis and the detection limits** used must be appropriate for the expected concentrations. For the monitoring of any constituent or parameter that is found

in concentrations which produce more than 90% non-numerical determinations (i.e., “trace” or “ND”) in data from background monitoring points for that medium, the analytical method having the lowest method detection limit (MDL) shall be selected from among those methods which would provide valid results in light of any matrix effects or interferences.

11. **“Trace” results** - results falling between the MDL and the practical quantitation limit (PQL) - shall be reported as such, and shall be accompanied by both the estimated MDL and PQL values for that analytical run.
12. **MDLs and PQLs** shall be derived by the laboratory for each analytical procedure, according to State of California laboratory accreditation procedures. These MDLs and PQLs shall reflect the detection and quantitation capabilities of the specific analytical procedure and equipment used by the lab, rather than simply being quoted from USEPA analytical method manuals. In relatively interference-free water, laboratory-derived MDLs and PQLs are expected to closely agree with published USEPA MDLs and PQLs.
13. If the laboratory suspects that, due to a change in matrix or other effects, the true detection limit or quantitation limit for a particular analytical run differs significantly from the laboratory-derived MDL/PQL values, the results shall be flagged accordingly, along with estimates of the detection limit and quantitation limit actually achieved. The MDL shall always be **calculated such that it represents the lowest achievable concentration associated with a 99% reliability of a nonzero result**. The PQL shall always be calculated such that it represents the lowest constituent concentration at which a numerical value can be assigned with reasonable certainty that it represents the constituent’s actual concentration in the sample. Normally, PQLs should be set equal to the concentration of the lowest standard used to calibrate the analytical procedure.
14. **All QA/QC data** shall be reported, along with the sample results to which they apply, including the method, equipment, analytical detection and quantitation limits, the percent recovery, an explanation for any recovery that falls outside the QC limits, the results of equipment and method blanks, the results of spiked and surrogate samples, the frequency of quality control analysis, and the name and qualifications of the person(s) performing the analyses. Sample results shall be reported unadjusted for blank results or spike recoveries. In cases where contaminants are detected in QA/QC samples (i.e., field, trip, or lab blanks), the accompanying sample results shall be appropriately flagged.
15. Unknown chromatographic peaks shall be reported, along with an estimate of the concentration of the unknown analyte. When unknown peaks are encountered, second column or second method confirmation procedures shall be performed to attempt to identify and more accurately quantify the unknown analyte.
16. The statistical method shall account for data below the practical quantitation limit (PQL) with one or more statistical procedures that are protective of human health and the

environment. Any PQL validated pursuant to §20415(e)(7) of Title 27 that is used in the statistical method shall be **the lowest concentration (or value) that can be reliably achieved** within limits of precision and accuracy specified in the WDRs for routine laboratory operating conditions that are available to the facility. The Discharger's technical report, pursuant to §20415(e)(7) of Title 27, shall consider the PQLs listed in Appendix IX to Chapter 14 of Division 4.5 of Title 22, California Code of Regulations, for guidance when specifying limits of precision and accuracy. For any given constituent monitored at a background or downgradient monitoring point, an indication that falls between the MDL and the PQL for that constituent (hereinafter called a "trace" detection) shall be identified and used in appropriate statistical or nonstatistical tests. Nevertheless, for a statistical method that is compatible with the proportion of censored data (trace and ND indications) in the data set, the Discharger can use the laboratory's concentration estimates in the trace range (if available) for statistical analysis, in order to increase the statistical power by decreasing the number of "ties."

17. Background for water samples or soil-pore gas samples shall be represented by the data from all samples taken from applicable background monitoring points during that reporting period (at least one sample from each background monitoring point). The Discharger may propose an alternate statistical method [to the methods listed under 27 CCR §20415(e)(8)(A-D)] in accordance with §20415(e)(8)(E) of Title 27, for review and approval by the Executive Officer.
18. The Discharger may propose an alternate statistical method [to the methods listed under 27 CCR §20415(e)(8)(A-D)] in accordance with §20415(e)(8)(E) of Title 27, for review and approval by the Executive Officer. Upon receiving written approval from the Executive Officer, alternate statistical procedures may be used for determining the significance of analytical results for common laboratory contaminants (i.e., methylene chloride, acetone, diethylhexyl phthalate, and di-n-octyl phthalate). Nevertheless, analytical results involving detection of these analytes in any background or downgradient sample shall be reported and flagged for easy reference by Regional Board staff.
19. The Discharger shall use the following nonstatistical method for all analytes, which are not amenable to the statistical test above. The nonstatistical method shall be implemented as follows:
 - a. For every compliance well, regardless of the monitoring program, the discharger shall use this data analysis method, jointly, for all analytes that are detected in less than 10% of background samples. Any analyte that triggers a discrete retest per this method shall be added to the monitoring parameter list:

Triggers — From the constituent of concern or monitoring parameter list identify each analyte in the **current** sample that exceeds either its respective MDL or PQL. The discharger shall conclude that the exceedance provides a preliminary indication [or, for

a retest, provide a measurably significant indication] of a release or a change in the nature or extent of the release, at that well, if ***either***:

- 1) The data contains two or more analytes that are detected in less than 10% of background samples that equal or exceed their respective MDLs; or
- 2) The data contains one analyte that equals or exceeds its PQL.

b. **Discrete Retest** [27 CCR §20415(e)(8)(E)]:

- 1) In the event that the discharger concludes (pursuant to paragraph 19.a., above) that there is a preliminary indication, then the discharger shall immediately notify Regional Board staff by phone or e-mail and, within 30 days of such indication, shall collect two new (retest) samples from the indicating compliance well.
- 2) For any given compliance well retest sample, the discharger shall include, in the retest analysis, only the laboratory analytical results for those analytes indicated in that well's original test. As soon as the retest data are available, the discharger shall apply the same test [under 19.a.], to separately analyze each of the two suites of retest data at that compliance well.
- 3) If either (or both) of the retest samples trips either (or both) of the triggers under ¶19.a., then the discharger shall conclude that there is a measurably significant increase at that well for the analyte(s) indicated in the validating retest sample(s) and shall:
 - a) **Immediately** notify the Regional Board about the constituent verified to be present at the monitoring point, and follow up with written notification submitted by certified mail **within seven days** of validation; and
 - b) If the Discharger believes that the constituent is from a source other than the Unit, then:
 - (a) **Within seven days** of determining "measurably significant" evidence of a release, submit to the Regional Board by certified mail a Notification of Intent to make such a demonstration pursuant to §20420(k)(7) of Title 27; and
 - (b) **Within 90 days** of determining "measurably significant" evidence of a release, submit a report to the Regional Board that demonstrates that a source other than the Unit caused the evidence, or that the evidence resulted from error in sampling, analysis or evaluation, or from natural variation in groundwater, surface water, or the unsaturated zone.

20. If the Executive Officer determines, after reviewing the submitted report in 19.b.3).b)(b) above, that the detected constituent most likely originated from the Unit(s), the Discharger shall immediately implement the requirements of XI. Response To A Release, C. Release Has Been Verified, contained in the Standard Provisions and Reporting Requirements (April 2000).

G. CORRECTIVE ACTION MONITORING

1. The Corrective Action Monitoring Program shall be used to assess the nature and extent of the release from the landfill and to evaluate the effectiveness of the corrective action program and the landfill cover.
2. In accordance with the Corrective Action Monitoring Program, the Discharger shall collect and analyze all data necessary to assess the effectiveness of the Corrective Action in reducing the impacts of the release on groundwater quality. A sufficient number of monitoring wells shall be installed to delineate the release.
3. The Discharger shall comply with the monitoring provisions for the Corrective Action Program (CAP) as described in Section 20430(d) of Title 27. The program shall include the detection monitoring program as well as an annual report evaluating the ground water and unsaturated data of the past year(s) in an effort to demonstrate the effectiveness of the CAP.

H. REPORTING REQUIREMENTS

1. In the event the Discharger does not comply or will be unable to comply with any prohibition or limitation of this Order for any reason, the Discharger shall notify the appropriate Regional Board office by telephone **as soon as** it or its agents have knowledge of such noncompliance or potential for noncompliance, and shall confirm this notification in writing **within two weeks**. The written notification shall state the nature, time, and cause of noncompliance, and shall describe the measures being taken to prevent recurrences and shall include a timetable for corrective actions.
2. The Discharger shall retain records of all monitoring information, including all calibration and maintenance records, all original strip chart recordings of continuous monitoring instrumentation, copies of all reports required by this Order, and records of all data used to complete the application for this Order. Records shall be maintained throughout the life of the facility including the postclosure period.

Such legible records shall show the following for each sample:

- a. Sample identification and the monitoring point or background monitoring point from which it was taken, along with the identity of the individual who obtained the sample;

- b. Date, time, and manner of sampling;
 - c. Date and time that analyses were started and completed, and the name of the personnel and laboratory performing each analysis;
 - d. Complete procedure used, including method of preserving the sample, and the identity and volumes of reagents used;
 - e. Calculation of results; and
 - f. Results of analyses, and the MDL and PQL for each analysis.
3. A transmittal letter explaining the essential points shall accompany each report. At a minimum, the transmittal letter shall identify any violations found since the last report was submitted, and if the violations were corrected. If no violations have occurred since the last submittal, this shall be stated in the transmittal letter. The transmittal letter shall also state that a discussion of any violations found since the last report was submitted, and a description of the actions taken or planned for correcting those violations, including any references to previously submitted time schedules, is contained in the accompanying report.
4. Each monitoring report shall include a compliance evaluation summary. The summary shall contain at least:
- a. For each monitoring point and background monitoring point addressed by the report, a description of:
 - 1) The time of water level measurement;
 - 2) The type of pump - or other device - used for purging and the elevation of the pump intake relative to the elevation of the screened interval;
 - 3) The method of purging (the pumping rate; the equipment and methods used to monitor field pH, temperature, and conductivity during purging; the calibration of the field equipment; results of the pH, temperature, conductivity, and turbidity testing; and the method of disposing of the purge water) to remove all portions of the water that was in the well bore while the sample was being taken;
 - 4) The type of pump - or other device - used for sampling, if different than the pump or device used for purging; and
 - 5) A statement that the sampling procedure was conducted in accordance with the approved Sampling and Analysis Plan.

- b. A map or aerial photograph showing the locations of observation stations, monitoring points, and background monitoring points.
- c. For each groundwater body, a description and graphical presentation of the gradient and direction of groundwater flow under/around the Unit, and the groundwater flow rate, based upon water level elevations taken prior to the collection of the water quality data submitted in the report.
- d. Laboratory statements of results of all analyses evaluating compliance with requirements.
- e. An evaluation of the effectiveness of the leachate monitoring and control facilities, and of the run-off/run-on control facilities.
- f. A summary and certification of completion of all **Standard Observations** for the Unit(s), for the perimeter of the Unit, and for the receiving waters. The Standard Observations shall be performed on a weekly basis and shall include:
 - 1) For the Unit:
 - a) Evidence of ponded water at any point on the facility (show affected area on map);
 - b) Evidence of odors - presence or absence, characterization, source, and distance of travel from source; and
 - c) Evidence of erosion and/or of day-lighted refuse.
 - 2) Along the perimeter of the Unit:
 - a) Evidence of liquid leaving or entering the Unit, estimated size of affected area, and flow rate (show affected area on map);
 - b) Evidence of odors - presence or absence, characterization, source, and distance of travel from source; and
 - c) Evidence of erosion and/or of day-lighted refuse.
 - 3) For receiving waters:
 - a) Floating and suspended materials of waste origin - presence or absence, source, and size of affected area;
 - b) Discoloration and turbidity - description of color, source, and size of affected area;

- c) Evidence of odors - presence or absence, characterization, source, and distance of travel from source;
 - d) Evidence of water uses - presence of water-associated wildlife;
 - e) Flow rate; and
 - f) Weather conditions - wind direction and estimated velocity, total precipitation during recent days and on the day of observation.
 - g. The quantity and types of wastes discharged and the locations in the Unit where waste has been placed since submittal of the last such report.
5. The Discharger shall report by telephone any seepage from the disposal area **immediately** after it is discovered. A written report shall be filed with the Regional Board **within seven days**, containing at least the following information:
- a. A map showing the location(s) of seepage and total quantity released;
 - b. An estimate of the flow rate;
 - c. A description of the nature of the discharge (e.g., all pertinent observations, samples and analyses (see Table VI Surface Water Monitoring Program and footnote);
 - d. Corrective measures underway or proposed, corresponding time schedule and proposed sampling and analysis plan to verify the success of the corrective measures.
6. The Discharger shall submit an **Annual Monitoring Summary Report** to the Regional Board covering the reporting period of the previous monitoring year. This report shall contain:
- a. All monitoring parameters and constituents of concern shall be graphed so as to show historical trends at each monitoring point and background monitoring point, for all samples taken within at least the previous five calendar years. Each such graph shall plot the concentration of one or more constituents for the period of record for a given monitoring point or background monitoring point, at a scale appropriate to show trends or variations in water quality. The graphs shall plot each datum, rather than plotting mean values. For any given constituent or parameter, the scale for background plots shall be the same as that used to plot downgradient data. Graphical analysis of monitoring data may be used to provide significant evidence of a release.
 - b. Unless otherwise exempted by the Executive Officer, all monitoring analytical data obtained during the previous two six-month reporting periods, shall be submitted in tabular form as well as in a digital file format acceptable to the Executive Officer. The Regional Board regards the submittal of data in hard copy and in digital format as

“...the form necessary for...” statistical analysis [§20420(h)], in that this facilitates periodic review by the Regional Board.

- c. A comprehensive discussion of the compliance record, and the result of any corrective actions taken or planned which may be needed to bring the Discharger into full compliance with the waste discharge requirements.
- d. A map showing the area and elevations in which filling has been completed during the previous calendar year and a comparison to final closure design contours.
- e. A written summary of the monitoring results, indicating any changes made or observed since the previous annual report.
- f. An evaluation of the effectiveness of the leachate monitoring/control facilities.

I. PROVISIONS

- 1. The Discharger shall maintain a copy of this Order at the facility and make it available at all times to facility operating personnel, who shall be familiar with its contents, and to regulatory agency personnel.
- 2. The Discharger shall comply with all applicable provisions of Title 27 and 40 Code of Federal Regulations Part 258 (Subtitle D) that are not specifically referred to in this Order.
- 3. The Discharger shall comply with Monitoring and Reporting Program No. R5-2003-0018, which is incorporated into and made part of this Order.
- 4. The Discharger shall comply with the applicable portions of the Standard Provisions and Reporting Requirements for Waste Discharge Requirements for Nonhazardous Solid Waste Discharges Regulated by Title 27 and/or Subtitle D (27 CCR §20005 et seq. and 40 CFR 258 et seq.), dated April 2000, which are hereby incorporated into this Order.
- 5. All reports and transmittal letters shall be signed by persons identified below:
 - a. For a corporation: by a principal executive officer of at least the level of senior vice-president.
 - b. For a partnership or sole proprietorship: by a general partner or the proprietor.
 - c. For a municipality, state, federal or other public agency: by either a principal executive officer or ranking elected or appointed official.
 - d. A duly authorized representative of a person designated in a, b or c above if;

- 1) The authorization is made in writing by a person described in a, b, or c of this provision;
 - 2) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of plant manager, operator of a Unit, superintendent, or position of equivalent responsibility. (A duly authorized representative may thus be either a named individual or any individual occupying a named position); and
 - 3) The written authorization is submitted to the Regional Board.
- e. Any person signing a document under this Section shall make the following certification:

“I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.”

6. The Discharger shall take all reasonable steps to minimize any adverse impact to the waters of the State resulting from noncompliance with this Order. Such steps shall include accelerated or additional monitoring as necessary to determine the nature, extent, and impact of the noncompliance.
7. The owner of the waste management facility shall have the continuing responsibility to assure protection of waters of the state from discharged wastes and from gases and leachate generated by discharged waste during the active life, closure, and postclosure maintenance period of the Unit(s) and during subsequent use of the property for other purposes.
8. The fact that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with this Order shall not be regarded as a defense for the Discharger's violations of the Order.
9. To assume ownership or operation under this Order, the succeeding owner or operator must apply in writing to the Regional Board requesting transfer of the Order within 14 days of assuming ownership or operation of this facility. The request must contain the requesting entity's full legal name, the State of incorporation if a corporation, the name and address and telephone number of the persons responsible for contact with the Regional Board, and a statement. The statement shall comply with the signatory requirements contained in Provision F.5. and state that the new owner or operator assumes full responsibility for compliance with this Order. Failure to submit the request shall be

considered a discharge without requirements, a violation of the California Water Code. Transfer of this Order shall be approved or disapproved by the Regional Board.

10. The Discharger shall establish cost estimates for initiating and completing corrective action for all known or reasonably foreseeable releases from the landfill, and submit these estimates to the Executive Officer for review and approval.
11. The Discharger shall obtain and maintain assurances of financial responsibility for initiating and completing corrective action for all known or reasonably foreseeable releases from the landfill in an amount approved by the Executive Officer, and shall submit the financial assurance mechanism to the Financial Assurances Section of the California Integrated Waste Management Board.
12. The Discharger is required to maintain financial assurance mechanisms for closure and post-closure maintenance costs as specified in Chapter 6 of Title 27. The Discharger is required to submit the financial assurance mechanism to the Financial Assurances Section of the California Integrated Waste Management Board, which determines if the mechanism meets the requirements of Chapter 6, Title 27, and if the amount of coverage is adequate.
13. The Discharger shall complete the tasks contained in these waste discharge requirements in accordance with the following time schedule:

<u>Task</u>	<u>Compliance Date</u>
A. Construction Plans	
Submit construction and design plans for Executive Officer review and approval. (see Construction Specification D.1)	Prior to construction
B. Construction Report	
Submit a construction report upon completion demonstrating construction was in accordance with approved construction plans for Executive Officer review and approval. (see Construction Specification D.4)	Prior to discharge

**C. Annual Testing of Leachate Collection
and Removal System**

Present results of annual LCRS testing for the landfill

**Second Quarter 2003
(annually thereafter)**

D. Corrective Action

1) Submit monthly interim gas control operations reports which provide updated information on performance of the system and the requisite gas monitoring data. Note: Monthly submittal commenced on 9 December 2002.

**9 February 2003
(monthly thereafter
until 9 May 2003)**

2) Submit a Corrective Action Assessment Report assessing the effectiveness of the interim gas control measures and the automated leachate extraction system installed in Sumps 1A and 2A. The report shall include additional or revised corrective action measures, as necessary.

15 May 2003

E. Financial Assurances

1) Submit updated Financial Assurances for initiating and completing corrective action and for all known or reasonably foreseeable releases from the Unit.

30 July-Annually

2) Submit the financial assurance mechanism for initiating and completing corrective action for all
Task

30 March 2003

Compliance Date

known or reasonably foreseeable releases from the landfill to the Financial Assurances Section of the California Integrated Waste Management Board.

F. Flood Control Improvements

Submit a report documenting the completion of minor southern perimeter road improvements or the construction of an interim berm to ensure adequate flood protection.

1 July 2003

G. Installation of additional monitoring wells

1) Submit a workplan for the installation of Well MW-16.

1 April 2003

- | | |
|---|---|
| 2) Install Well MW-16. | 1 May 2003 |
| 3) Report first sampling round for Well MW-16 in the Second Quarter 2003 Monitoring Report. | 31 July 2003 |
| 4) Submit a workplan for the installation of Interim Wells T-1 and T-2. | One month prior to the initial placement of waste in Phase 4 of Cell 1 |
| 5) Install Wells T-1 and T-2. | One month after the initial placement of waste in Phase 4 of Cell 1 |
| 6) Report first sampling round for Wells T-1 and T-2 in a Quarterly Monitoring Report | Within 6 months of the initial placement of waste in Phase 4 of Cell 1 |
| 7) Submit a work plan which includes a time-schedule for the installation of the additional monitoring wells and the gas probes at the locations shown on Attachment B. All gas probes shall be located within ten feet of the footprint of the landfill. | One year prior to placing waste in any future cell |

I, THOMAS R. PINKOS, Executive Officer, do hereby certify that the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, Central Valley Region, on 31 January 2003.

THOMAS R. PINKOS, Executive Officer

RDB: 1/31/2003

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM NO. R5-2003-0018
FOR
NORCAL WASTE SYSTEMS OSTROM ROAD LANDFILL, INC.
FOR
OSTROM ROAD CLASS II SOLID WASTE LANDFILL FACILITY
YUBA COUNTY

Compliance with this Monitoring and Reporting Program, with Title 27, California Code of Regulations, Section 20005, et seq. (hereafter Title 27), and with the *Standard Provisions and Reporting Requirements for Waste Discharge Requirements for Nonhazardous Solid Waste Discharges Regulated by Title 27 and/or Subtitle D (27 CCR §20005 et seq. and 40 CFR 258)*, dated April 2000, is ordered by Waste Discharge Requirements Order No. R5-2003-0018.

A. REQUIRED MONITORING REPORTS

<u>Report</u>	<u>Due</u>
1. Groundwater Monitoring (Section D.1)	See Table I
2. Annual Monitoring Summary Report (Order No. R5-2003-0018, H.6.)	Annually
3. Unsaturated Zone Monitoring (Section D.2)	See Table II
4. Landfill Gas Monitoring (Section D.3)	See Table III
5. Leachate Monitoring (Section D.4)	See Table IV
6. Leak Detection Monitoring(Section D.5)	See Table V
7. Surface Water Monitoring (Section D.6)	See Table VI
8. Facility Monitoring (Section D.7)	As necessary
9. Response to a Release (Standard Provisions and Reporting Requirements)	As necessary

B. REPORTING

The Discharger shall report monitoring data and information as required in this Monitoring and Reporting Program and as required in Order No. R5-2003-0018 and the Standard Provisions and Reporting Requirements. Reports which do not comply with the required format will be **REJECTED** and the Discharger shall be deemed to be in

noncompliance with the waste discharge requirements. In reporting the monitoring data required by this program, the Discharger shall arrange the data in tabular form so that the date, the constituents, the concentrations, and the units are readily discernible. The data shall be summarized in such a manner so as to illustrate clearly the compliance with waste discharge requirements or the lack thereof. Data shall also be submitted in a digital format acceptable to the Executive Officer.

Each monitoring report shall include a compliance evaluation summary as specified in H. Reporting Requirements, of Order No. R5-2003-0018.

Field and laboratory tests shall be reported in each monitoring report. Monthly, quarterly, semiannual, and annual monitoring reports shall be submitted to the Board in accordance with the following schedule for the calendar period in which samples were taken or observations made.

<u>Sampling Frequency</u>	<u>Reporting Frequency</u>	<u>Reporting Periods End</u>	<u>Report Date Due</u>
Monthly	Quarterly	Last Day of Month	by Semiannual Schedule
Quarterly	Quarterly	31 March	30 April
		30 June	31 July
		30 September	31 October
		31 December	31 January
Semiannually	Semiannually	30 June	31 July
		31 December	31 January
Annually	Annually	31 December	31 January

The Discharger shall submit an **Annual Monitoring Summary Report** to the Board covering the previous monitoring year. The annual report shall contain the information specified in H. Reporting Requirements, of Order No. R5-2003-0018, and a discussion of compliance with the waste discharge requirements and the Water Quality Protection Standard.

The results of **all monitoring** conducted at the site shall reported to the Board in accordance with the reporting schedule above for the calendar period in which samples were taken or observations made.

C. WATER QUALITY PROTECTION STANDARD AND COMPLIANCE PERIOD

1. Water Quality Protection Standard Report

For each waste management unit (Unit), the Water Quality Protection Standard shall consist of all constituents of concern, the concentration limit for each constituent of concern, the point of compliance, and all water quality monitoring points.

The Water Quality Protection Standard for naturally occurring waste constituents consists of the constituents of concern, the concentration limits, and the point of compliance and all monitoring points. The Executive Officer shall review and approve the Water Quality Protection Standard, or any modification thereto, for each monitored medium.

If subsequent sampling of the background monitoring point(s) indicates significant water quality changes due to either seasonal fluctuations or other reasons unrelated to waste management activities at the site, the Discharger may request modification of the Water Quality Protection Standard.

2. Constituents of Concern

The constituents of concern include all the waste constituents, their reaction products, and hazardous constituents that are reasonably expected to be in or derived from waste contained in the Unit. The constituents of concern for all Units at the facility are those listed in Tables I through VII for the specified monitored medium, and Table VIII. The Discharger shall monitor all constituents of concern every five years, or more frequently as required in accordance with a Corrective Action Program.

a. Monitoring Parameters

Monitoring parameters are constituents of concern that are the waste constituents, reaction products, hazardous constituents, and physical parameters that provide a reliable indication of a release from a Unit. The monitoring parameters for all Units are those listed in Tables I through VI for the specified monitored medium.

3. Concentration Limits

For a naturally occurring constituent of concern, the concentration limit for each constituent of concern shall be determined as follows:

- a. By calculation in accordance with a statistical method pursuant to §20415 of Title 27; or
- b. By an alternate statistical method acceptable to the Executive Officer in accordance with §20415 of Title 27.

The established concentration limits for naturally occurring constituents of concern are listed in Tables IX through XI.

4. Point of Compliance

The point of compliance for the water standard at each Unit is a vertical surface located at the hydraulically down-gradient limit of the Unit that extends through the uppermost aquifer underlying the Unit.

5. Compliance Period

The compliance period for each Unit shall be the number of years equal to the active life of the Unit plus the closure period. The compliance period is the minimum period during which the Discharger shall conduct a water quality monitoring program subsequent to a release from the Unit. The compliance period shall begin anew each time the Discharger initiates an evaluation monitoring program.

D. MONITORING

The Discharger shall comply with the detection monitoring program provisions of Title 27 for groundwater, surface water, and the unsaturated zone, in accordance with Detection Monitoring Specification F.2 and F.4 of Waste Discharge Requirements, Order No. R5-2003-0018. Detection monitoring for a new Unit shall be installed, operational, and one year of monitoring data collected **prior to** the discharge of wastes. All monitoring shall be conducted in accordance with a Sample Collection and Analysis Plan, which includes quality assurance/quality control standards, that is acceptable to the Executive Officer.

All point of compliance monitoring wells established for the detection monitoring program shall constitute the monitoring points for the groundwater Water Quality Protection Standard. All detection monitoring and corrective action monitoring program groundwater monitoring wells, unsaturated zone monitoring devices, leachate, and surface water monitoring points shall be sampled and analyzed for monitoring parameters and constituents of concern as indicated and listed in Tables I through VIII.

Method detection limits and practical quantitation limits shall be reported. All peaks shall be reported, including those which cannot be quantified and/or specifically identified. Metals shall be analyzed in accordance with the methods listed in Table VIII. The Discharger may, with the approval of the Executive Officer, use alternative analytical test methods, including new USEPA approved methods, provided the methods have method detection limits equal to or lower than the analytical methods specified in this Monitoring and Reporting Program.

1. Groundwater

The Discharger shall operate and maintain a groundwater detection monitoring system that complies with the applicable provisions of §20415 and §20420 of Title 27 in accordance with a Detection Monitoring Program approved by the Executive Officer. The Discharger shall collect, preserve, and transport groundwater samples in accordance with an approved Groundwater Monitoring Procedures Plan.

The monitoring well network (Attachment B) currently consists of background monitoring wells MW-1, MW-2 and MW-3, detection monitoring wells MW-4 through MW-8 and corrective action Piezometers PZ-11, PZ-12 and PZ-13. The piezometers were installed to monitor ephemerally perched water within the vadose zone north of Cells 1A and 2A as a part of the corrective action monitoring program. As the landfill expands, additional detection monitoring wells (MW-9 through MW-17) shall be installed at the approximate locations near the boundaries of the landfill as shown on Attachment B. In addition, interim monitoring wells shall be installed and monitored to provide the earliest possible detection of a release to groundwater. The wells are considered interim because they will be located within the permitted landfill footprint. As new landfill cells are constructed, the wells shall be properly destroyed prior to landfill cell construction and only with Executive Officer review and approval. Detection monitoring well MW-4, MW-6 and MW-8 are currently interim monitoring wells located immediately downgradient of Cells 1A and 1B (Attachment B). Two additional interim wells (T-1 and T-2) shall be constructed downgradient of Sump 1 Temp and downgradient of a proposed sump location in the future Phase 4 unit of Cell 1. Two additional interim wells (T-3 and T-4) shall be constructed prior to the construction of Cells 8A and 8B at the approximate locations shown on Attachment B.

Background monitoring wells MW-2 and MW-3 will be re-assigned as detection monitoring wells as the landfill expands to the east and Cells 3A and Cell 3B are constructed. Any additional monitoring wells constructed at the site as new cells are constructed shall be added to the monitoring network.

The Discharger shall determine the groundwater flow rate and direction in the uppermost aquifer and in any zones of perched water and in any additional zone of saturation monitored pursuant to this Monitoring and Reporting Program, and report the results quarterly, including the times of highest and lowest elevations of the water levels in the wells and piezometers.

Hydrographs of each well shall be submitted showing the elevation of groundwater with respect to the elevations of the top and bottom of the screened interval and the elevation of the pump intake. Hydrographs of each well shall be prepared quarterly and submitted annually.

Groundwater samples shall be collected from the point-of-compliance wells, background wells, and any additional wells added as part of the approved groundwater monitoring system. Samples shall be collected and analyzed for the monitoring parameters in accordance with the methods and frequency specified in Table I.

The monitoring parameters shall also be evaluated each reporting period with regards to the cation/anion balance, and the results shall be graphically presented using a Stiff diagram, a Piper graph, or a Schueller plot. Samples for the constituents of concern specified in Table I shall be collected and analyzed in accordance with the methods listed in Table VIII every five years.

The last 5-year Constituent-of-Concern (COC) groundwater monitoring event was conducted during the fourth quarter of 2001; therefore, the next COC event is scheduled to take place in the fourth quarter of the year 2006.

2. Unsaturated Zone Monitoring

The Discharger shall operate and maintain an unsaturated zone detection monitoring system that complies with the applicable provisions of §20415 and §20420 of Title 27 in accordance with a detection monitoring plan approved by the Executive Officer. The Discharger shall collect, preserve, and transport samples in accordance with the quality assurance/quality control standards contained in an approved Sample Collection and Analysis Plan.

Unsaturated zone samples shall be collected from the monitoring devices and background monitoring devices of the approved unsaturated zone monitoring system (Attachment B). The unsaturated zone monitoring points consist of background suction lysimeter VZ-1, corrective action monitoring suction lysimeter VZ-2 (located beneath the clay liner which underlies Pan Lysimeters PL-1A), corrective action monitoring Pan Lysimeter PL-1A and PL-2A and any pan lysimeters or other unsaturated zone monitoring points installed as the additional landfill modules are constructed. The collected samples shall be analyzed for the listed constituents in accordance with the methods and frequency specified in Table II. All monitoring parameters shall be graphed so as to show historical trends at each monitoring point. Samples for the constituents of concern specified in Table II shall be collected and analyzed in accordance with the methods listed in Table VIII every five years.

Pan lysimeters shall be checked monthly for liquid and monitoring shall also include the total volume of liquid removed from the system. Unsaturated zone monitoring reports shall be included with the corresponding semiannual groundwater monitoring and shall include an evaluation of potential impacts of the facility on the unsaturated zone and compliance with the Water Quality

Protection Standard.

The last 5-year Constituent-of-Concern (COC) vadose zone monitoring event was conducted during the fourth quarter of 2001; therefore, the next COC event is scheduled to take place in the fourth quarter of the year 2006.

3. Gas Monitoring

Gas samples shall be also collected from the gas probes (Attachment B) on a quarterly basis as a part of the unsaturated zone landfill gas detection monitoring program and monitored for methane, carbon dioxide, oxygen content and organic vapors using field instruments (Table III). If the photoionization detector indicates the presence of organic vapors in a monitoring probe then a gas sample shall be obtained and analyzed for VOCs using EPA Method TO-14. In addition, gas samples shall be obtained annually from the gas probes during the fourth quarter monitoring events and analyzed for VOCs using EPA Method TO14. The Discharger shall conduct verification testing (see Detection Monitoring Specification F.19.b in WDRs Order No. R5-2003-0018) to determine whether a release of VOC_{spg} has occurred if the data meet either of the trigger conditions of Detection Monitoring Specifications F.19.b. in WDRs Order No. R5-2003-0018.

As part of the corrective action monitoring program, landfill gas samples shall be obtained at the locations and frequencies shown in Table III. The Discharger shall submit monthly operations reports containing updated information on the gas system performance and monitoring data for a period of six months with the first monthly report due 9 February 2003 (the first two reports were due on 9 December 2002 and 9 January 2003, respectively). The Discharger shall submit a Corrective Action Assessment Report to Regional Board staff on 15 May 2003 which documents the effectiveness of the first six months of interim gas control measures. If the landfill gas and VOC concentrations at the corrective action landfill gas monitoring points do not show statistically significant downward trends in landfill gas and VOC concentrations then the Discharger shall submit a Phase II Corrective Action Plan for Executive Officer review and approval. If the interim system is effective in preventing the migration of VOCs through the landfill liner system then the interim gas control system shall continue to operate and be monitored as delineated in Table III.

4. Leachate Monitoring

All Unit leachate collection and removal system sumps shall be inspected weekly for leachate generation. Upon detection of leachate in a previously dry leachate collection and removal system, leachate shall be sampled **immediately** and

analyzed for the constituents listed in Table IV. Leachate shall then be sampled and analyzed annually during the fourth quarter thereafter, with a retest during the following second quarter if constituents are detected that have not been previously detected. Leachate samples shall be collected and analyzed for the listed constituents in accordance with the methods and frequency specified in Table IV. The constituents of concern list shall include all constituents listed in Table VIII. The quantity of leachate pumped from each sump shall be measured and reported monthly as Leachate Flow Rate (in gallons).

5. Leak Detection Monitoring

Leak detection layer sumps in the double liner systems shall be checked quarterly for the presence of liquid and the Discharger shall notify the Board within one week if liquid has been observed. Liquid samples shall be analyzed for Total Dissolved Solids (TDS), chloride and bicarbonate (Table V). All remaining liquid shall be pumped out of the leak detection layer within 48 hours. The leak detection layer shall be monitored for VOCs using a portable photoionization detector (PID) and for methane on a quarterly basis. If the monitoring results in detected concentrations of 1.0 percent methane OR 1.0 parts per million by volume (ppmv) of VOCs or greater then a gas sample shall be collected from that location and analyzed for speciated VOCs by EPA Method TO-14 (Table V). The PID monitoring for VOCs shall be conducted with calibration to a hexane standard or other straight-chain, fuel-related hydrocarbon. Conversion to benzene-equivalents shall be conducted using a response factor for benzene provided by the manufacturer. The results of the leak detection layer sampling shall be reported in the quarterly monitoring reports. Gas control measures shall be implemented for a Class II module upon the detection of gas-phase concentrations of VOCs as specified in Specification C.14 of WDRs Order No. R5-2003-0018.

6. Surface Water Monitoring

The Discharger shall install and operate a surface water detection monitoring system where appropriate that complies with the applicable provisions of §20415 and §20420 of Title 27 and has been approved by the Executive Officer.

For all monitoring points assigned to surface water detection monitoring, samples shall be collected and analyzed for the monitoring parameters in accordance with the methods and frequency specified in Table VI. The surface water monitoring points shall consist of SW-1 and SW-3 (Attachment B).

All surface water monitoring samples shall be collected and analyzed for the constituents of concern specified in Table VIII every five years. All monitoring parameters shall be graphed so as to show historical trends at each sample location.

The last 5-year Constituent-of-Concern (COC) surface water monitoring event

was conducted during the fourth quarter of 2001; therefore, the next COC event is scheduled to take place in the fourth quarter of the year 2006.

7. Facility Monitoring

a. Facility Inspection

Annually, prior to the anticipated rainy season, but no later than **30 September**, the Discharger shall conduct an inspection of the facility. The inspection shall assess damage to the drainage control system, groundwater monitoring equipment (including wells, etc.), and shall include the Standard Observations contained in section **H.4.f.** of Order No. R5-2003-0018. Any necessary construction, maintenance, or repairs shall be completed by **31 October**. By **15 November** of each year, the Discharger shall submit an annual report describing the results of the inspection and the repair measures implemented, including photographs of the problem and the repairs.

b. Storm Events

The Discharger shall inspect all precipitation, diversion, and drainage facilities for damage **within 7 days** following *major storm events*. Necessary interim repairs shall be completed **within 10 days** of the inspection and permanent repairs shall be completed when feasible. The Discharger shall report any damage and subsequent repairs within 45 days of completion of the repairs, including photographs of the problem and the repairs.

The Discharger shall implement the above monitoring program on the effective date of this Program.

Ordered by: _____
THOMAS R. PINKOS, Executive Officer

31 January 2003

(Date)

RDB:1/31/03

TABLE I
GROUNDWATER MONITORING PROGRAM

<u>Parameter</u>	<u>Units</u>	<u>Frequency</u> *
Field Parameters		
Groundwater Elevation	Ft. & hundredths, M.S.L.	Quarterly
Temperature	°C	Quarterly
Electrical Conductivity	µmhos/cm	Quarterly
pH	pH units	Quarterly
Turbidity	Turbidity units	Quarterly
Monitoring Parameters		
Total Dissolved Solids (TDS)	mg/L	Quarterly
Chloride	mg/L	Quarterly
Carbonate	mg/L	Quarterly
Bicarbonate	mg/L	Quarterly
Nitrate - Nitrogen	mg/L	Quarterly
Sulfate	mg/L	Quarterly
Calcium	mg/L	Quarterly
Magnesium	mg/L	Quarterly
Potassium	mg/L	Quarterly
Sodium	mg/L	Quarterly
Volatile Organic Compounds (USEPA Method 8260, see Table VII)	µg/L	Quarterly
Constituents of Concern (see Table VIII)		
Total Organic Carbon	mg/L	5 years
Inorganics (dissolved)	mg/L	5 years
Volatile Organic Compounds (USEPA Method 8260B, extended list)	µg/L	5 years
Semi-Volatile Organic Compounds (USEPA Method 8270C)	µg/L	5 years
Chlorophenoxy Herbicides (USEPA Method 8151A)	µg/L	5 years
Organophosphorus Compounds (USEPA Method 8141A)	µg/L	5 years

Note:

* Background monitoring wells may be analyzed on a semi-annual basis.

TABLE II
UNSATURATED ZONE DETECTION MONITORING PROGRAM

<u>Parameter</u>	<u>Units</u>	<u>Frequency*</u>
Field Parameters		
Electrical Conductivity	µmhos/cm	Quarterly
pH	pH units	Quarterly
Monitoring Parameters		
Total Dissolved Solids (TDS)	mg/L	Quarterly
Chloride	mg/L	Quarterly
Carbonate	mg/L	Quarterly
Bicarbonate	mg/L	Quarterly
Nitrate - Nitrogen	mg/L	Quarterly
Sulfate	mg/L	Quarterly
Calcium	mg/L	Quarterly
Magnesium	mg/L	Quarterly
Potassium	mg/L	Quarterly
Sodium	mg/L	Quarterly
Volatile Organic Compounds (USEPA Method 8260B, see Table VII)	µg/L	Quarterly
Constituents of Concern (see Table VIII)		
Total Organic Carbon	mg/L	5 years
Inorganics (dissolved)	mg/L	5 years
Volatile Organic Compounds (USEPA Method 8260B, extended list)	µg/L	5 years
Semi-Volatile Organic Compounds (USEPA Method 8270C)	µg/L	5 years
Chlorophenoxy Herbicides (USEPA Method 8151A)	µg/L	5 years
Organophosphorus Compounds (USEPA Method 8141A)	µg/L	5 years

Note:

* Background monitoring points may be analyzed on a semi-annual basis.

TABLE III
GAS MONITORING PROGRAM

Landfill Gas Detection Monitoring Program

Location	Landfill Gas Monitoring Parameters				VOCs By
	Methane	Carbon Dioxide	Oxygen	Organic vapors	EPA TO-14
All constructed gas probes	Quarterly	Quarterly	Quarterly	Quarterly	Annually*

Legend:

LFG Field Monitoring using GEM 500 (LFG) and portable Photo Ionization Detector (PID) Meter (VOCs). The PID shall be calibrated and results presented as benzene equivalents.

* Gas samples shall be obtained annually during the fourth quarter monitoring event and analyzed for VOCs using EPA Method TO-14. If the PID identifies the presence of organic vapors during a quarterly monitoring event then gas samples shall also be obtained and analyzed for VOCs using EPA Method TO-14.

Corrective Action Landfill Gas Monitoring

Location	Landfill Gas Monitoring Parameters				VOCs By	
	Methane	Carbon Dioxide	Oxygen	VOCs	EPA 8260	EPA TO-14
PL-1A	W/M	W/M	W/M			
VZ-2	W/M	W/M	W/M	M		
Sump 1A Riser	W/M	W/M	W/M	M		
Gas Probe 1S/1D	W/M	W/M	W/M	M		M
GeoNet 1	W/M	W/M	W/M	M		
PZ-13	W/M	W/M	W/M	M	M*	
PL-2A Sump 2A Riser	W/M	W/M	W/M	M	M	M
PZ-11	W/M	W/M	W/M	M	M*	
PZ-12	W/M	W/M	W/M	M	M*	
GeoNet2	W/M	W/M	W/M	M		
LFG Treatment System	W	W	W	**		**

Legend:

LFG Field Monitoring – GEM 500 (LFG) and Portable PID Meter (VOCs). The PID shall be calibrated and results presented as benzene equivalents.

M - monthly

W/M – Weekly for first month, then monthly

W - Weekly

* - Piezometers PZ-11, PZ-12 and PZ-13 shall be checked on a monthly basis for the presence of ephemerally perched water. If water is present then samples shall be obtained and analyzed accordingly.

** - As required by the Feather River AQMD Permit

TABLE IV

LEACHATE DETECTION MONITORING PROGRAM

<u>Parameter</u>	<u>Units</u>	<u>Frequency</u>
Field Parameters		
Total Flow	Gallons	Weekly
Flow Rate	Gallons/Day	Weekly
Electrical Conductivity	µmhos/cm	Annually
pH	pH units	Annually
Monitoring Parameters		
Total Dissolved Solids (TDS)	mg/L	Annually
Chloride	mg/L	Annually
Carbonate	mg/L	Annually
Bicarbonate	mg/L	Annually
Nitrate - Nitrogen	mg/L	Annually
Sulfate	mg/L	Annually
Calcium	mg/L	Annually
Magnesium	mg/L	Annually
Potassium	mg/L	Annually
Sodium	mg/L	Annually
Volatile Organic Compounds (USEPA Method 8260B, see Table VII)	µg/L	Annually
Constituents of Concern (see Table VIII)		
Total Organic Carbon	mg/L	5 years
Inorganics (dissolved)	mg/L	5 years
Volatile Organic Compounds (USEPA Method 8260B, extended list)	µg/L	5 years
Semi-Volatile Organic Compounds (USEPA Method 8270C)	µg/L	5 years
Chlorophenoxy Herbicides (USEPA Method 8151A)	µg/L	5 years
Organophosphorus Compounds (USEPA Method 8141A)	µg/L	5 years

TABLE V

**LEAK DETECTION MONITORING
(Quarterly)**

Location	Liquid Analysis (if present)	Gas Analysis*
All leak detection layer sumps	Total Dissolved Solids	Organic vapors using PID
	Chloride	Methane
	Bicarbonate	

- * If the monitoring results in detected concentrations of 1.0 percent methane OR 1.0 parts per million by volume (ppmv) of VOCs or greater then a gas sample shall be collected from that location and analyzed for speciated VOCs by EPA Method TO-14. The PID monitoring for VOCs shall be conducted with calibration to a hexane standard or other straight-chain, fuel-related hydrocarbon. Conversion to benzene-equivalents shall be conducted using a response factor for benzene provided by the manufacturer.

TABLE VI

SURFACE WATER DETECTION MONITORING PROGRAM

<u>Parameter</u>	<u>Units</u>	<u>Frequency</u> *
Field Parameters		
Temperature	°C	Annually
Electrical Conductivity	µmhos/cm	Annually
pH	pH units	Annually
Monitoring Parameters		
Total Dissolved Solids (TDS)	mg/L	Annually
Bicarbonate Alkalinity	mg/L	Annually
Chloride	mg/L	Annually
Nitrate as Nitrogen	mg/L	Annually
Volatile Organic Compounds (USEPA Method 8260B, see Table VII)	µg/L	Annually
Constituents of Concern (see Table VIII)		
Inorganics (dissolved)	mg/L	5 years
Volatile Organic Compounds (USEPA Method 8260B, extended list)	µg/L	5 years
Semi-Volatile Organic Compounds (USEPA Method 8270C)	µg/L	5 years
Chlorophenoxy Herbicides (USEPA Method 8151A)	µg/L	5 years
Organophosphorus Compounds (USEPA Method 8141A)	µg/L	5 years

* Surface water samples shall be collected during the first storm that produces runoff and when leachate seeps are observed that may have impacted surface water quality. If leachate seeps are identified extending out of the disposal area or that potentially impact on-site drainages, those drainages shall be sampled as close to the leachate as possible.

TABLE VII

MONITORING PARAMETERS FOR DETECTION MONITORING

Surrogates for Metallic Constituents:

pH
Total Dissolved Solids
Electrical Conductivity
Chloride
Sulfate
Nitrate nitrogen

Constituents included in VOC:

USEPA Method 8260B

Acetone
Acrylonitrile
Tert-Amyl ethyl ether
Benzene
Bromobenzene
Bromochloromethane
Bromodichloromethane
Bromoform (Tribromomethane)
n-Butylbenzene
sec-Butylbenzene
tert-Butylbenzene
Carbon disulfide
Carbon tetrachloride
Chlorobenzene
Chloroethane (Ethyl chloride)
Chloroform (Trichloromethane)
Dibromochloromethane (Chlorodibromomethane)
1,2-Dibromo-3-chloropropane (DBCP)
1,2-Dibromoethane (Ethylene dibromide; EDB)
o-Dichlorobenzene (1,2-Dichlorobenzene)
m-Dichlorobenzene (1,3-Dichlorobenzene)
p-Dichlorobenzene (1,4-Dichlorobenzene)
trans-1,4-Dichloro-2-butene
Dichlorodifluoromethane (CFC-12)
1,1-Dichloroethane (Ethylidene chloride)
1,2-Dichloroethane (Ethylene dichloride)
1,1 -Dichloroethylene (1,1 -Dichloroethene; Vinylidene chloride)
cis- 1,2-Dichloroethylene (cis- 1,2-Dichloroethene)
trans-1,2-Dichloroethylene (trans-1,2-Dichloroethene)
1,2-Dichloropropane (Propylene dichloride)
cis- 1,3-Dichloropropene
trans- 1,3-Dichloropropene
Di-isopropylether (DIPE)
1,4 Dioxane
Ethanol

TABLE VII
MONITORING PARAMETERS FOR DETECTION MONITORING

Continued

di-Isopropyl ether
Ethyltertiary butyl ether
Ethylbenzene
2-Hexanone (Methyl butyl ketone)
Hexachlorobutadiene
Hexachloroethane
Methyl bromide (Bromomethene)
Methyl chloride (Chloromethane)
Methylene bromide (Dibromomethane)
Methylene chloride (Dichloromethane)
Methyl ethyl ketone (MEK: 2-Butanone)
Methyl iodide (Iodomethane)
Methyl t-butyl ether
4-Methyl-2-pentanone (Methyl isobutylketone)
Naphthalene
2-Nitropropane
n-Propylbenzene
Styrene
Tertiary amyl methyl ether
Tertiary butyl alcohol
1,1,1,2-Tetrachloroethane
1,1,2,2-Tetrachloroethane
Tetrachloroethylene (Tetrachloroethene; Perchloroethylene)
Toluene
1,2,4-Trichlorobenzene
1,1,1-Trichloroethane (Methylchloroform)
1,1,2-Trichloroethane
Trichloroethylene (Trichloroethene)
Trichlorofluoromethane (CFC- 11)
1,2,3-Trichloropropane
1,2,4-Trimethylbenzene
1,3,5-Trimethylbenzene
Vinyl acetate
Vinyl chloride
Xylenes (total)

TABLE VIII
CONSTITUENTS OF CONCERN & APPROVED USEPA ANALYTICAL METHODS

<u>Inorganics (dissolved):</u>	<u>USEPA Method</u>
Aluminum	6010
Antimony	7041
Barium	6010
Beryllium	6010
Cadmium	7131A
Chromium	6010
Cobalt	6010
Copper	6010
Silver	6010
Tin	6010
Vanadium	6010
Zinc	6010
Iron	6010
Manganese	6010
Arsenic	7062
Lead	7421
Mercury	7470A
Nickel	7521
Selenium	7742
Thallium	7841
Cyanide	9010B
Sulfide	9030B

Volatile Organic Compounds:

USEPA Method 8260

Acetone
 Acetonitrile (Methyl cyanide)
 Acrolein
 Acrylonitrile
 Allyl chloride (3-Chloropropene)
 Tert-Amyl ethyl ether
 Benzene
 Bromobenzene
 Bromochloromethane (Chlorobromomethane)
 Bromodichloromethane (Dibromochloromethane)
 Bromoform (Tribromomethane)
 n-Butylbenzene
 sec-Butylbenzene
 tert-Butylbenzene
 Carbon disulfide
 Carbon tetrachloride
 Chlorobenzene
 Chloroethane (Ethyl chloride)
 Chloroform (Trichloromethane)

TABLE VIII

CONSTITUENTS OF CONCERN & APPROVED USEPA ANALYTICAL METHODS

Continued

Chloroprene
Dibromochloromethane (Chlorodibromomethane)
1,2-Dibromo-3-chloropropane (DBCP)
1,2-Dibromoethane (Ethylene dibromide; EDB)
o-Dichlorobenzene (1,2-Dichlorobenzene)
m-Dichlorobenzene (1,3-Dichlorobenzene)
p-Dichlorobenzene (1,4-Dichlorobenzene)
trans- 1,4-Dichloro-2-butene
Dichlorodifluoromethane (CFC 12)
1,1 -Dichloroethane (Ethylidene chloride)
1,2-Dichloroethane (Ethylene dichloride)
1,1 -Dichloroethylene (1, 1-Dichloroethene; Vinylidene chloride)
cis- 1,2-Dichloroethylene (cis- 1,2-Dichloroethene)
trans- 1,2-Dichloroethylene (trans- 1,2-Dichloroethene)
1,2-Dichloropropane (Propylene dichloride)
1,3-Dichloropropane (Trimethylene dichloride)
2,2-Dichloropropane (Isopropylidene chloride)
1,1 -Dichloropropene
cis- 1,3-Dichloropropene
trans- 1,3-Dichloropropene
Di-isopropylether (DIPE)
1,4-Dioxane
Ethanol
Ethyltertiary butyl ether
Ethylbenzene
Ethyl methacrylate
Hexachlorobutadiene
Hexachloroethane
2-Hexanone (Methyl butyl ketone)
Isobutyl alcohol
Methacrylonitrile
Methyl bromide (Bromomethane)
Methyl chloride (Chloromethane)
Methyl ethyl ketone (MEK; 2-Butanone)
Methyl iodide (Iodomethane)
Methyl t-butyl ether
Methyl methacrylate
4-Methyl-2-pentanone (Methyl isobutyl ketone)
Methylene bromide (Dibromomethane)
Methylene chloride (Dichloromethane)
Naphthalene
2-Nitropropane
n-Propylbenzene

TABLE VIII

CONSTITUENTS OF CONCERN & APPROVED USEPA ANALYTICAL METHODS

Continued

Propionitrile (Ethyl cyanide)
Styrene
Tertiary amyl methyl ether
Tertiary butyl alcohol
1,1,1,2-Tetrachloroethane
1,1,2,2-Tetrachloroethane
Tetrachloroethylene (Tetrachloroethene; Perchloroethylene; PCE)
Toluene
1,2,4-Trichlorobenzene
1,1,1 -Trichloroethane, Methylchloroform
1,1,2-Trichloroethane
Trichloroethylene (Trichloroethene; TCE)
Trichlorofluoromethane (CFC- 11)
1,2,3-Trichloropropane
1,2,4-Trimethylbenzene
1,3,5-Trimethylbenzene
Vinyl acetate
Vinyl chloride (Chloroethene)
Xylene (total)

Semi-Volatile Organic Compounds:

USEPA Method 8270 - base, neutral, & acid extractables

Acenaphthene
Acenaphthylene
Acetophenone
2-Acetylaminofluorene (2-AAF)
Aldrin
4-Aminobiphenyl
Anthracene
Benzo[a]anthracene (Benzanthracene)
Benzo[b]fluoranthene
Benzo[k]fluoranthene
Benzo[g,h,i]perylene
Benzo[a]pyrene
Benzyl alcohol
Bis(2-ethylhexyl) phthalate
alpha-BHC
beta-BHC
delta-BHC
gamma-BHC (Lindane)
Bis(2-chloroethoxy)methane
Bis(2-chloroethyl) ether (Dichloroethyl ether)
Bis(2-chloro-1-methylethyl) ether (Bis(2-chloroisopropyl) ether; DCIP)

TABLE VIII

CONSTITUENTS OF CONCERN & APPROVED USEPA ANALYTICAL METHODS

Continued

4-Bromophenyl phenyl ether
Butyl benzyl phthalate (Benzyl butyl phthalate)
Chlordane
p-Chloroaniline
Chlorobenzilate
p-Chloro-m-cresol (4-Chloro-3-methylphenol)
2-Chloronaphthalene
2-Chlorophenol
4-Chlorophenyl phenyl ether
Chrysene
o-Cresol (2-methylphenol)
m-Cresol (3-methylphenol)
p-Cresol (4-methylphenol)
4,4'-DDD
4,4'-DDE
4,4'-DDT
Diallate
Dibenz[a,h]anthracene
Dibenzofuran
Di-n-butyl phthalate
3,3'-Dichlorobenzidine
2,4-Dichlorophenol
2,6-Dichlorophenol
Dieldrin
Diethyl phthalate
p-(Dimethylamino)azobenzene
7,12-Dimethylbenz[a]anthracene
3,3'-Dimethylbenzidine
2,4-Dimehtylphenol (m-Xylenol)
Dimethyl phthalate
m-Dinitrobenzene
4,6-Dinitro-o-cresol (4,6-Dinitro-2-methylphenol)
2,4-Dinitrophenol
2,4-Dinitrotoluene
2,6-Dinitrotoluene
Di-n-octyl phthalate
Diphenylamine
Endosulfan I
Endosulfan II
Endosulfan sulfate
Endrin
Endrin aldehyde
Ethyl methanesulfonate

TABLE VIII

CONSTITUENTS OF CONCERN & APPROVED USEPA ANALYTICAL METHODS

Continued

Famphur
Fluoranthene
Fluorene
Heptachlor
Heptachlor epoxide
Hexachlorobenzene
Hexachlorocyclopentadiene
Hexachloropropene
Indeno(1,2,3-c,d)pyrene
Isodrin
Isophorone
Isosafrole
Kepone
Methapyrilene
Methoxychlor
3-Methylcholanthrene
Methyl methanesulfonate
2-Methylnaphthalene
1,4-Naphthoquinone
1-Naphthylamine
2-Naphthylamine
o-Nitroaniline (2-Nitroaniline)
m-Nitroaniline (3-Nitroaniline)
p-Nitroaniline (4-Nitroaniline)
Nitrobenzene
o-Nitrophenol (2-Nitrophenol)
p-Nitrophenol (4-Nitrophenol)
N-Nitrosodi-n-butylamine (Di-n-butylnitrosamine)
N-Nitrosodiethylamine (Diethylnitrosamine)
N-Nitrosodimethylamine (Dimethylnitrosamine)
N-Nitrosodiphenylamine (Diphenylnitrosamine)
N-Nitrosodipropylamine (N-Nitroso-N-dipropylamine; Di-n-propylnitrosamine)
N-Nitrosomethylethylamine (Methylethylnitrosamine)
N-Nitrosopiperidine
N-Nitrosopyrrolidine
5-Nitro-o-toluidine
Pentachlorobenzene
Pentachloronitrobenzene (PCNB)
Pentachlorophenol
Phenacetin
Phenanthrene
Phenol
p-Phenylenediamine
Polychlorinated biphenyls (PCBs; Aroclors)
Pronamide

TABLE VIII

CONSTITUENTS OF CONCERN & APPROVED USEPA ANALYTICAL METHODS

Continued

Pyrene
Safrole
1,2,4,5-Tetrachlorobenzene
2,3,4,6-Tetrachlorophenol
o-Toluidine
Toxaphene
2,4,5-Trichlorophenol
0,0,0-Triethyl phosphorothioate
sym-Trinitrobenzene

Chlorophenoxy Herbicides:

USEPA Method 8151A

2,4-D (2,4-Dichlorophenoxyacetic acid)
Dinoseb (DNBP; 2-sec-Butyl-4,6-dinitrophenol)
Silvex (2,4,5-Trichlorophenoxypropionic acid; 2,4,5-TP)
2,4,5-T (2,4,5-Trichlorophenoxyacetic acid)

Organophosphorus Compounds:

USEPA Method 8141A

Atrazine
Chlorpyrifos
0,0-Diethyl 0-2-pyrazinyl phosphorothioate (Thionazin)
Diazinon
Dimethoate
Disulfoton
Ethion
Methyl parathion (Parathion methyl)
Parathion
Phorate
Simazine

TABLE IX– GROUNDWATER CONCENTRATION LIMITS

<u>Constituent</u>	<u>Units</u>	<u>Concentration Limit*</u>
Specific conductance	µmhos/cm	405
pH	pH Units	6.4-7.4
Total Dissolved Solids (TDS)	mg/L	310
Chloride	mg/L	14
Sulfate	mg/L	19
Nitrate-nitrite as N	mg/L	13
Total Organic Carbon	mg/L	2.7
Carbonate Alkalinity	mg/L	MDL
Bicarbonate Alkalinity	mg/L	170
Total Alkalinity	mg/L	170
VOCs (EPA 8260B)	µg/L	MDL
SVOCs (EPA 8270C)	µg/L	MDL
Chlorophenoxy Herbicides (EPA 8151A)	µg/L	MDL
Organophosphorus Compounds (EPA 8141A)	µg/L	MDL
Aluminum, dissolved	µg/L	200
Antimony, dissolved	µg/L	MDL
Arsenic, dissolved	µg/L	6.0
Barium, dissolved	µg/L	23
Beryllium, dissolved	µg/L	MDL
Cadmium, dissolved	µg/L	NE
Chromium, dissolved	µg/L	MDL
Chromium VI+, dissolved	µg/L	MDL
Cobalt, dissolved	µg/L	MDL
Copper, dissolved	µg/L	30
Cyanide, total	µg/L	MDL
Iron, dissolved	µg/L	510
Lead, dissolved	µg/L	NE
Manganese, dissolved	µg/L	43
Mercury, dissolved	µg/L	MDL
Nickel, dissolved	µg/L	MDL
Selenium, dissolved	µg/L	MDL
Silver, dissolved	µg/L	MDL
Sulfide, dissolved	µg/L	MDL
Thallium, dissolved	µg/L	MDL
Tin, dissolved	µg/L	MDL
Vanadium, dissolved	µg/L	15
Zinc, dissolved	µg/L	30

Notes:
 MDL = Laboratory Method Detection Limit
 NE = Not established

* Concentration limits shall be updated as additional data is obtained. Concentration limits are not required for calcium, magnesium, potassium and sodium. They shall be evaluated each reporting period with regards to the cation/anion balance and the results shall be graphically presented using a Stiff Diagram, a Piper Diagram or a Schueller Plot.

TABLE X- SURFACE WATER CONCENTRATION LIMITS

<u>Constituent</u>	<u>Units</u>	<u>Concentration Limit*</u>
Specific conductance	µmhos/cm	330
pH	pH Units	6.6-8.7
Total Dissolved Solids (TDS)	mg/L	250
Chloride	mg/L	12
Sulfate	mg/L	19
Nitrate-nitrite as N	mg/L	3.0
Total Organic Carbon	mg/L	13
Carbonate Alkalinity	mg/L	MDL
Bicarbonate Alkalinity	mg/L	150
Total Alkalinity	mg/L	150
VOCs (EPA 8260B)	µg/L	MDL
SVOCs (EPA 8270C)	µg/L	MDL
Chlorophenoxy Herbicides (EPA 8151A)	µg/L	MDL
Organophosphorus Compounds (EPA 8141A)	µg/L	MDL
Aluminum, dissolved	µg/L	980
Antimony, dissolved	µg/L	MDL
Arsenic, dissolved	µg/L	NE
Barium, dissolved	µg/L	30
Beryllium, dissolved	µg/L	MDL
Cadmium, dissolved	µg/L	MDL
Chromium, dissolved	µg/L	MDL
Chromium VI+, dissolved	µg/L	MDL
Cobalt, dissolved	µg/L	MDL
Copper, dissolved	µg/L	NE
Cyanide, total	µg/L	MDL
Iron, dissolved	µg/L	1,700
Lead, dissolved	µg/L	NE
Manganese, dissolved	µg/L	110
Mercury, dissolved	µg/L	MDL
Nickel, dissolved	µg/L	MDL
Selenium, dissolved	µg/L	MDL
Silver, dissolved	µg/L	MDL
Sulfide, dissolved	µg/L	MDL
Thallium, dissolved	µg/L	MDL
Tin, dissolved	µg/L	MDL
Vanadium, dissolved	µg/L	NE
Zinc, dissolved	µg/L	NE

Notes:

MDL = Laboratory Method Detection Limit

NE = Not established

* Concentration limits shall be updated as additional data is obtained.

TABLE XI- UNSATURATED ZONE CONCENTRATION LIMITS
 (INCLUDES CONCENTRATION LIMITS FOR GAS-PHASE VOCs)

Constituent	Units	Concentration Limit*
Specific conductance	µmhos/cm	847
pH	pH Units	6.1-7.8
Total Dissolved Solids (TDS)	mg/L	690
Chloride	mg/L	4.7
Sulfate	mg/L	180
Nitrate-nitrite as N	mg/L	38
Total Organic Carbon	mg/L	NE
Carbonate Alkalinity	mg/L	MDL
Bicarbonate Alkalinity	mg/L	600
Total Alkalinity	mg/L	600
VOCs (EPA 8260B)	µg/L	MDL
VOCs-gas (EPA TO-14)	ug/L vapor or ppbv	MDL
SVOCs (EPA 8270C)	µg/L	MDL
Chlorophenoxy Herbicides (EPA 8151A)	µg/L	MDL
Organophosphorus Compounds (EPA 8141A)	µg/L	MDL
Aluminum, dissolved	µg/L	NE
Antimony, dissolved	µg/L	NE
Arsenic, dissolved	µg/L	NE
Barium, dissolved	µg/L	NE
Beryllium, dissolved	µg/L	NE
Cadmium, dissolved	µg/L	NE
Chromium, dissolved	µg/L	NE
Chromium VI+, dissolved	µg/L	NE
Cobalt, dissolved	µg/L	NE
Copper, dissolved	µg/L	NE
Cyanide, total	µg/L	NE
Iron, dissolved	µg/L	NE
Lead, dissolved	µg/L	NE
Manganese, dissolved	µg/L	NE
Mercury, dissolved	µg/L	NE
Nickel, dissolved	µg/L	NE
Selenium, dissolved	µg/L	NE
Silver, dissolved	µg/L	NE
Sulfide, dissolved	µg/L	NE
Thallium, dissolved	µg/L	NE
Tin, dissolved	µg/L	NE
Vanadium, dissolved	µg/L	NE
Zinc, dissolved	µg/L	NE

Notes:
 MDL = Laboratory Method Detection Limit
 NE = Not established
 Ppbv = Parts per billion by volume

* Concentration limits shall be updated as additional data is obtained. Concentration limits are not required for calcium, magnesium, potassium and sodium. They shall be evaluated each reporting period with regards to the cation/anion balance and the results shall be graphically presented using a Stiff Diagram, a Piper Diagram or a Schueller Plot.